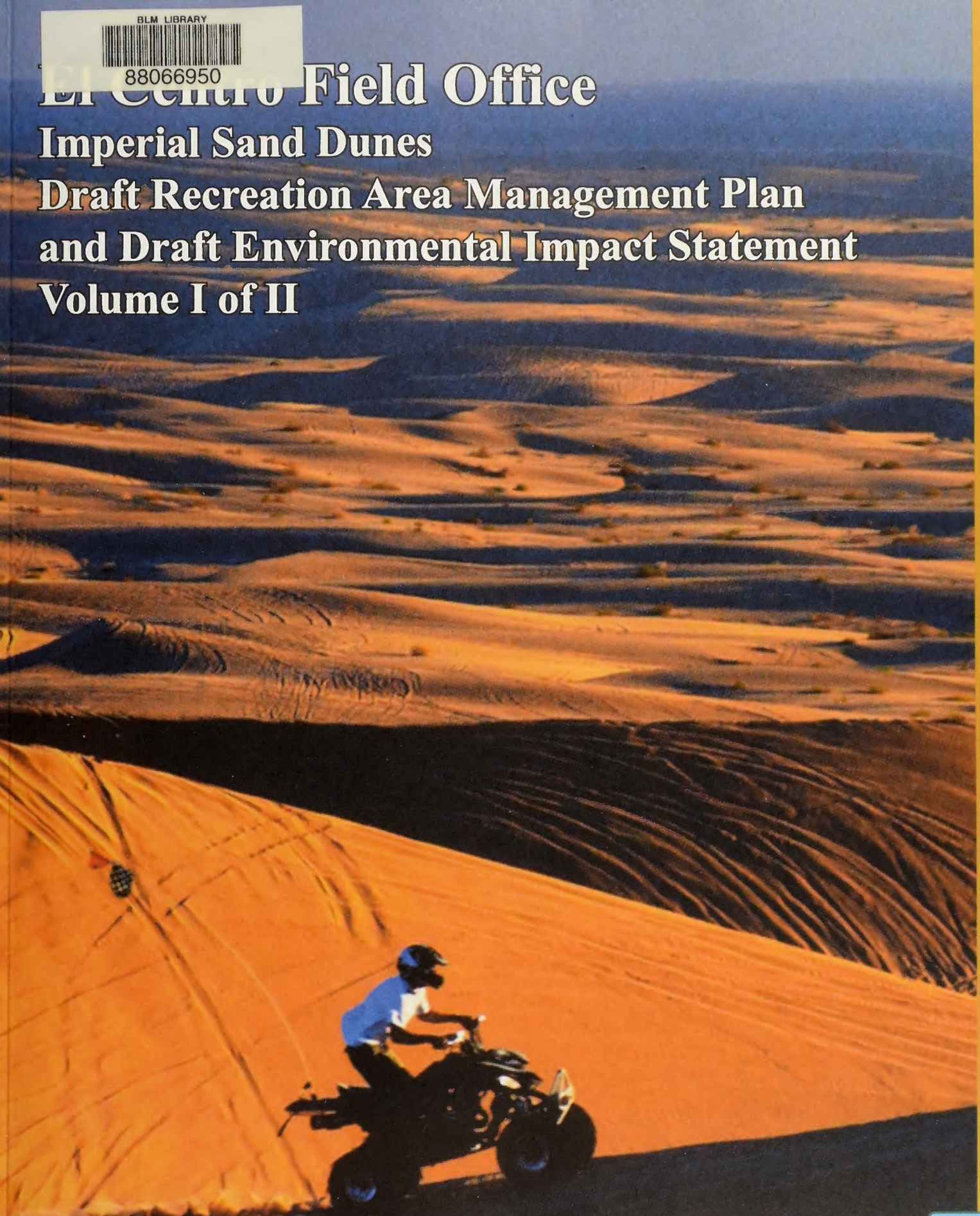
BLM LIBRARY
88066950

El Centro Field Office

Imperial Sand Dunes
Draft Recreation Area Management Plan
and Draft Environmental Impact Statement
Volume I of II



United States Department of the Interior
Bureau of Land Management
March 2010

BLM

El Centro Field Office

Front cover photograph acknowledgement:
Photograph Courtesy of Mr. Kevin Marty

DOI Control #DES-09-16
Publication Index #BLM/CA/ES-2009-023+1793

Abstract

The Imperial Sand Dunes Draft Recreation Area Management Plan (RAMP) and Draft Environmental Impact Statement (EIS) describes and analyzes eight alternatives for managing approximately 214,930 acres of Bureau of Land Management-administered lands within the Imperial Sand Dunes Special Recreation Management Area in Imperial County, California. Information provided by the public, Bureau of Land Management personnel, and other agencies and organizations has been used to develop and analyze the alternatives in the Draft RAMP and Draft EIS.

The eight alternatives under consideration generally vary by the allowed level of motorized use and extent of preservation of the area's cultural and natural resources. Alternative 1 is the No Action Alternative, which describes the management conditions prescribed in the 1987 RAMP for the Planning Area. Alternative 2 describes the continuation of the present management of the Planning Area. Alternative 3 generally places emphasis on preservation of the Planning Area's natural and cultural resources through limited public use. It proposes fewer motorized and developed recreation opportunities. Alternatives 4 through 6 propose a combination of natural processes and active management techniques for recreation and use management. Management under these alternatives includes decisions that are a balance of multiple uses. Alternative 4 identifies a higher level of preservation and a lower level of motorized use, recreation opportunities, and renewable development than Alternatives 5 and 6. Alternative 5 identifies a moderate level of preservation and a moderate level of motorized use, recreation opportunities, and renewable development than Alternatives 4 and 6. Alternative 6 identifies a lower level of preservation and a higher level of motorized use, recreation opportunities, and renewable development than Alternatives 4 and 5. Alternative 7 generally places an emphasis on consumer-driven uses and the widest array of uses, such as renewable energy, transportation, and utility rights-of-way, and enhanced recreational opportunities (including motorized use). It places a greater emphasis on developed and motorized recreation opportunities and less on remote settings and primitive recreation. Alternative 8 is the Preferred Alternative, which provides for management of each resource and resource use, and provides for a balance between authorized resource use and the protection and long-term sustainability of sensitive resources. It allows visitation and development within the Planning Area while ensuring that resource protection is not compromised in accordance with the principles of multiple use and sustained yield as mandated by the Federal Land Policy and Management Act. The proposed decisions under this alternative could be identical to those under one of the other alternatives presented or could be a combination of features from several of the other alternatives.

Major issues addressed in this Draft RAMP and Draft EIS include management of recreation and public access, special designations, special status species, mineral resources, and lands and realty.

Mission Statement

The Bureau of Land Management is responsible for stewardship of our public lands. The Bureau of Land Management is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife habitat, wilderness, air and scenic quality, as well as scientific and cultural values.

607127078
ID88066950
HD
243
.C2
I474
2010
v.1

Imperial Sand Dunes
Draft Recreation Area Management Plan
and
Draft Environmental Impact Statement

Prepared by
US Department of the Interior
Bureau of Land Management
El Centro Field Office
California

March 2010

Daniel Steward
Acting Field Manager, El Centro

Jack Hamby
Acting District Manager, California Desert

James W. Abbott
Acting State Director

THIS PAGE IS INTENTIONALLY BLANK.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
El Centro Field Office
1661 S. 4th Street
El Centro, CA 92243
(760) 337-4436

TAKE PRIDE IN AMERICA

In reply refer to: 1610-DP-670.36 P

February, 2010

Dear Reader:

Attached for your review and comment is the Draft Imperial Sand Dunes Recreation Area Management Plan/Draft Environmental Impact Statement (Draft RAMP/EIS) for the California Bureau of Land Management (BLM) El Centro Field Office. BLM prepared this document in consultation with cooperating agencies, and in accordance with the National Environmental Policy Act of 1969 (NEPA), the Federal Land Policy and Management Act of 1976 (FLPMA), implementing regulations, the BLM's Land Use Planning Handbook (H-1601-1), and other applicable law and policy.

The planning area consists of about 200,000 acres of land which includes about 150,000 acres of public lands managed by the El Centro Field Office, located in Imperial County. When approved, this RMP will replace the previous 1987 and 2003 RAMP documents and will guide the management of public lands administered by the El Centro Field Office into the future. The Draft Imperial Sand Dunes Recreation Area Managmeent Plan/Draft EIS and supporting information are available on the project web site at: www.blm.gov/en/fo/elcentro.

The BLM encourages the public to provide information and comments pertaining to the analysis presented in the Draft RAMP/EIS. We are particularly interested in feedback concerning the adequacy and accuracy of the proposed alternatives, the analysis of their respective management decisions, and any new information that would help the BLM as it develops the plan. In developing the Proposed RAMP/Final EIS, which is the next phase of the planning process, the decision maker may select various management decisions from each of the alternatives analyzed in the Draft RAMP/EIS for the purpose of creating a management strategy that best meets the needs of the resources and values in this area under the BLM multiple use and sustained yield mandate. As a member of the public, your timely comments on the Draft Imperial Sand Dunes Recreation Area Managmeent Plan/Draft EIS will help formulate the Proposed RAMP/Final EIS. Comments will be accepted for ninety (90) calendar days following the Environmental Protection Agency's (EPA) publication of its Notice of Availability in the Federal Register. The BLM can best utilize your comments and resource information submissions if received within the review period.

Comments may be submitted electronically at: caisdrmp@ca.blm.gov. Comments may also be submitted by mail to: BLM El Centro Field Office, 1661 S. 4th Street, El Centro, CA 92243. To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments in an electronic format.

Your review and comments on the content of this document are critical to the success of this planning effort. If you wish to submit comments on the Draft RAMP/EIS, we request that you make your comments as specific as possible. Comments will be more helpful if they include suggested changes, sources, or methodologies, and reference to a section or page number. Comments containing only opinion or preferences will be considered and included as part of the decision making process, although they will not receive a formal response from the BLM.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Public meetings to provide an overview of the document, respond to questions, and take public comments will be announced by local media, website, and/or public mailings at least 15 days in advance.

Copies of the Draft RAMP/EIS have been sent to affected Federal, state and local government agencies, as well as affected tribal governments. Copies of the Draft RAMP/EIS are available for public inspection at the BLM El Centro Field Office (see address above), and the BLM California State Office, 2800 Cottage Way, Sacramento, CA 95825.

Thank you for your continued interest in the Draft Imperial Sand Dunes Recreation Area Management Plan/Draft Environmental Impact Statement (Draft RAMP/EIS). We appreciate the information and suggestions you contribute to the planning process. For additional information or clarification regarding this document or the planning process, please contact Erin Dreyfuss, RAMP Team Lead, BLM California State Office at (916) 978-4642 or edreyfus@ca.blm.gov.

Sincerely,

Daniel Steward
Acting Field Manager, El Centro Field Office
Bureau of Land Management

READER'S GUIDE

How to Use this Document

This Draft Recreation Area Management Plan/Draft Environmental Impact Statement (Draft RAMP/Draft EIS) is presented in five chapters and appendices, consistent with federal requirements that guide the preparation of an EIS.

- **Chapter 1** sets the stage by describing the purpose and need for its preparation as well as providing key background information.
- **Chapter 2** describes several potential management approaches, or "alternatives." This document describes eight alternative land use plans, including the no action alternative and a preferred alternative.
- **Chapter 3** describes the environment, or resources, that would be affected by the decisions contained in the individual alternatives.
- **Chapter 4** describes the impacts of the potential decisions on these resources.
- **Chapter 5** describes the actions undertaken to provide open and effective participation from members of the public, as well as from organizations, governmental agencies, and consultation with the tribes that all have a stake in the outcome of this process.

The appendices and glossary provide more detailed information, which some readers may find helpful when reviewing the main text of the document.

In many cases, potential decisions or other discussions contained in this Draft RAMP/Draft EIS refer directly to maps and tables. In fact, many potential decisions themselves are "map based." The reader must rely on the text, maps, and tables taken together to fully understand the potential decisions described for each alternative.

How to Comment on this Document

The Notice of Availability in the Federal Register initiates a 90-day public review and comment period. During this period, comments may be submitted using one of the following methods:

E-mail comments to: caisdrmp@ca.blm.gov

All written comments should be sent to:
RAMP Team Lead
1661 South 4th Street
El Centro, CA 92243

Comments may be made in person at one of the public meetings conducted in local communities. The specific dates and times for these meetings will be announced in local newspapers, in a newsletter, and on the Bureau of Land Management Web site (www.ca.blm.gov).

Freedom of Information Act Considerations

Public comments submitted during this planning review, including names and street addresses of respondents, will be available for public review at the El Centro Field Office during regular business hours (8:00 a.m. to 4:30 p.m.), Monday through Friday, except holidays. Individual respondents may request confidentiality. If you wish to withhold your name or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your comments. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

Tips for Reviewing and Commenting on the Draft RAMP/Draft EIS

- Does the Preferred Alternative provide for the uses and activities you consider most important in the Imperial Sand Dunes administered by the El Centro Field Office? If not, why?
- Does the Preferred Alternative adequately protect the values, resources, or conditions you consider important in the Imperial Sand Dunes administered by the El Centro Field Office? If not, why?
- Are there any flaws in the analysis? If so, what specifically?
- Is there new information that would have a bearing on the analysis? If so, what?
- Do we need to clarify any of the potential decisions? If so, which?
- Is there anything we missed that should be in the Draft EIS? If so, what?

The El Centro Field Office planning team is willing to meet with groups, individuals, or members of the media to go over the key points in the Draft RAMP/Draft EIS (call the RAMP Team Lead at 760.337.4400).

TABLE OF CONTENTS

Executive Summary ES-1

1.0 Introduction 1-1

1.1 Purpose of and Need for Action 1-2

1.1.1 Purpose 1-2

1.1.2 Need 1-3

1.2 Planning Area 1-3

1.3 Scoping Issues 1-4

1.3.1 Public Scoping 1-4

1.3.2 Planning Issues 1-5

1.4 Planning Criteria/Legislative Constrains 1-6

1.4.1 Planning Criteria 1-6

1.4.2 Laws, Regulations, and Executive Orders 1-7

1.5 Planning Process 1-8

1.5.1 Relationship to Policies, Plans, and Programs 1-9

1.6 Overall Vision 1-15

2.0 Description of Alternatives 2-1

2.1 Introduction 2-1

2.2 General Description of Each Alternative 2-1

2.3 Comparison of Alternatives 2-3

2.3.1 Rangeland Health Standards Management 2-3

2.3.2 Air Resources Management 2-6

2.3.3 Soil Resource Management 2-7

2.3.4 Water Resources Management 2-8

2.3.5 Vegetative Resource Management 2-10

2.3.6 Wildlife Resource Management 2-18

2.3.7 Special Status Species Management 2-24

2.3.8 Wildland Fire Management 2-34

2.3.9 Cultural Resource Management 2-36

2.3.10 Paleontological Resource Management 2-40

2.3.11 Visual Resource Management 2-41

2.3.12 Special Designations 2-44

2.3.13 Mineral Resource Management 2-48

2.3.14 Recreation Resource Management 2-55

2.3.15 Transportation and Public Access 2-69

2.3.16 Lands and Realty Management 2-71

2.3.17 Public Health and Safety 2-87

2.4 Comparison of Impact by Alternative 2-92

TABLE OF CONTENTS (CONT.)

3.0 Affected Environment **3-1**
3.1 Introduction **3-1**
3.2 Air and Atmospheric Values **3-2**
3.2.1 Climate and Meteorology 3-2
3.2.2 Air Quality 3-4
3.3 Soil Resources **3-12**
3.3.1 Sand and Soils 3-12
3.4 Water Resources **3-15**
3.4.1 Surface Water 3-15
3.4.2 Groundwater 3-17
3.4.3 Watershed Basins and Hydrologic Units 3-18
3.4.4 Water Use 3-18
3.4.5 Regulatory Setting 3-18
3.4.6 Federal Reserved Water Rights for Designated Wilderness Areas 3-19
3.5 Vegetation Resources **3-20**
3.5.1 Vegetation Communities 3-20
3.5.2 Priority Plant Species 3-21
3.5.3 Invasive and Noxious Weed Species 3-24
3.6 Wildlife **3-25**
3.6.1 General Wildlife 3-25
3.6.2 Wildlife Habitat Improvements 3-27
3.6.3 Priority Wildlife Species Habitat 3-27
3.6.4 Insects 3-28
3.7 Special Status Species **3-32**
3.7.1 Federally Listed Species 3-35
3.7.2 State-listed Species 3-40
3.7.3 BLM Sensitive Species 3-43
3.8 Wildland Fire Ecology and Management **3-56**
3.8.1 Fire Regimes and Risk Conditions 3-56
3.8.2 Fire Management Units and Wildfire History 3-57
3.9 Cultural Resources **3-58**
3.9.1 Prehistoric Context 3-58
3.9.2 Ethnographic Context 3-61
3.9.3 Historic Context 3-66
3.9.4 Previous Research 3-68
3.9.5 Site Significance 3-74
3.9.6 Historically Significant Linear Features 3-77
3.9.7 California Historic Landmarks 3-79

TABLE OF CONTENTS (CONT.)

3.10 Paleontological Resources **3-80**
3.11 Visual Resources **3-82**
3.11.1 Regulatory Framework 3-82
3.11.2 Existing Visual Resource Management 3-84
3.11.3 Visual Resources of the Planning Area 3-85
3.11.4 VRM Inventory—Scenic Quality Rating Units 3-88
3.11.5 Summary of Visual Inventory Classification 3-93
3.12 Special Designations **3-93**
3.12.1 Wilderness Areas 3-95
3.12.2 Areas of Critical Environmental Concern 3-96
3.13 Mineral Resources **3-97**
3.13.1 Mineral Resource Potential 3-98
3.13.2 Locatable (Metallic and Non-metallic) Minerals 3-98
3.13.3 Leasable (Fluid and Solid Energy, and Solid) Minerals 3-100
3.13.4 Salable (Construction Material) Minerals 3-104
3.14 Recreation Management **3-105**
3.14.1 Regulatory Framework 3-106
3.14.2 Fee Program 3-106
3.14.3 Special Recreation Permits 3-107
3.14.4 Volunteer Events 3-107
3.14.5 Other Non-permitted Events (Events Not Requiring a Permit) 3-107
3.14.6 Visitor Use Areas 3-107
3.14.7 Recreation Visitation 3-112
3.14.8 Management Practices 3-114
3.14.9 Historical Trends 3-116
3.15 Transportation and Public Access **3-116**
3.15.1 Motorized Vehicle Access 3-117
3.15.2 Non-motorized Vehicle Access 3-118
3.16 Lands and Realty **3-118**
3.16.1 Utility Corridors and Communications 3-118
3.16.2 Land Tenure 3-119
3.16.3 Land Use Authorizations 3-120
3.16.4 Withdrawals 3-123
3.16.5 Renewable Energy 3-123
3.17 Public Health and Safety **3-125**
3.17.1 Hazardous Materials and Public Health 3-125
3.17.2 Noise 3-126
3.17.3 Law Enforcement and Public Safety 3-129

TABLE OF CONTENTS (CONT.)

3.18 Social and Economic Setting **3-133**
3.18.1 Social/Cultural/Economic History 3-133
3.18.2 Demographic and Socioeconomic Characteristics 3-135
3.18.3 Social Trends 3-143
3.18.4 Affected Users 3-145
3.18.5 Economic Characteristics 3-151
3.19 Environmental Justice **3-170**
3.19.1 Minority and Low-income Communities 3-171
4.0 Environmental Consequences **4-1**
4.1 Introduction **4-1**
4.1.1 Analytical Assumptions 4-1
4.1.2 Types of Effects 4-1
4.1.3 Summary of Critical Elements Addressed, Not Addressed, Not Affected, or Not Present 4-2
4.1.4 Potential Impacts to Resources by Alternative 4-2
4.2 Impacts on Air and Atmospheric Values **4-3**
4.2.1 Analysis Assumptions 4-3
4.2.2 Air Quality (Criteria Pollutant Emissions) 4-4
4.2.3 Odors 4-7
4.2.4 Climate Change 4-7
4.2.5 Differences between Alternatives 4-8
4.2.6 Unavoidable Adverse Impacts 4-8
4.2.7 Cumulative Impacts 4-8
4.3 Impacts on Soil Resources **4-8**
4.3.1 Impacts Resulting in Compaction and Erosion 4-9
4.3.2 Differences between Alternatives 4-10
4.3.3 Unavoidable Adverse Impacts 4-11
4.3.4 Cumulative Impacts 4-11
4.4 Impacts on Water Resources **4-12**
4.4.1 Differences between Alternatives 4-13
4.4.2 Unavoidable Adverse Impacts 4-14
4.4.3 Cumulative Impacts 4-14
4.5 Impacts on Vegetative Resources **4-14**
4.5.1 Differences between Alternatives 4-16
4.5.2 Unavoidable Adverse Impacts 4-18
4.5.3 Short-term Use and/or Long-term Productivity 4-18
4.5.4 Cumulative Impacts 4-18

TABLE OF CONTENTS (CONT.)

4.6 Impacts on Wildlife Resources **4-19**
4.6.1 General Wildlife 4-19
4.6.2 Priority Wildlife Species 4-21
4.6.3 Insect Species 4-22
4.6.4 Differences between Alternatives 4-22
4.6.5 Unavoidable Adverse Impacts 4-23
4.6.6 Short-term Use and/or Long-term Productivity 4-23
4.6.7 Cumulative Impacts 4-23
4.7 Impacts on Special Status Species **4-24**
4.7.1 Habitat Alteration, Fragmentation, and/or Loss 4-26
4.7.2 Federally Listed Species 4-29
4.7.3 State-listed and BLM Sensitive Species 4-31
4.7.4 Differences between Alternatives 4-32
4.7.5 Unavoidable Adverse Impacts 4-36
4.7.6 Short-term Use and/or Long-term Productivity 4-36
4.7.7 Cumulative Impacts 4-36
4.8 Impacts on Wildland Fire **4-38**
4.8.1 Differences between Alternatives 4-38
4.8.2 Unavoidable Adverse Impacts 4-39
4.9 Impacts on Cultural Resources **4-39**
4.9.1 Direct and Indirect Impacts to Cultural Resources 4-41
4.9.2 Differences between Alternatives 4-43
4.9.3 Unavoidable Adverse Impacts 4-44
4.9.4 Cumulative Impacts 4-45
4.10 Impacts on Paleontological Resources **4-45**
4.10.1 Loss or Degradation of Paleontological Resources 4-45
4.10.2 Differences between Alternatives 4-47
4.10.3 Unavoidable Adverse Impacts 4-47
4.10.4 Cumulative Impacts 4-47
4.11 Impacts on Visual Resources **4-47**
4.11.1 Loss and Degradation of Visual Resources 4-48
4.11.2 Differences between Alternatives 4-50
4.11.3 Unavoidable Adverse Impacts 4-57
4.11.4 Cumulative Impacts 4-57
4.12 Impacts on Special Designations **4-58**
4.12.1 Differences between Alternatives 4-59
4.12.2 Unavoidable Adverse Impacts 4-62

TABLE OF CONTENTS (CONT.)

4.12.3 Cumulative Impacts 4-63
4.13 Impacts on Mineral Resources 4-63
4.13.1 Impacts on Locatable (Metallic and Non-metallic/ Industrial) Minerals 4-63
4.13.2 Impacts on Leasable (Energy) Resources 4-64
4.13.3 Impacts on Salable (Construction) Materials 4-64
4.13.4 Differences between Alternatives 4-64
4.14 Impacts on Recreation Program 4-65
4.14.1 Differences between Alternatives 4-67
4.14.2 Unavoidable Adverse Impacts 4-69
4.14.3 Cumulative Impacts 4-69
4.15 Transportation and Public Access 4-69
4.15.1 Differences between Alternatives 4-70
4.15.2 Unavoidable Adverse Impacts 4-72
4.15.3 Cumulative Impacts 4-72
4.16 Impacts on Lands and Realty Program 4-72
4.16.1 Differences between Alternatives 4-73
4.16.2 Cumulative Impacts 4-73
4.17 Impacts on Public Health and Safety 4-74
4.17.1 Differences between Alternatives 4-76
4.17.2 Unavoidable Adverse Impacts 4-77
4.17.3 Cumulative Impacts 4-78
4.18 Social and Economic Impacts 4-79
4.18.1 Impacts on Mineral Resources 4-80
4.18.2 Impacts on Recreation Program 4-82
4.18.3 Impacts on Transportation and Public Access 4-87
4.18.4 Impacts on Lands and Realty Program 4-88
4.18.5 Summary of Economic Impacts by Alternative 4-91
4.18.6 Cumulative Impacts 4-93
4.19 Impacts on Environmental Justice 4-93
4.19.1 Minority and Low-income Communities 4-94
CHAPTER 5.0 Consultation and Coordination 5-1
5.1 Interrelationships 5-1
5.1.1 Other Federal Agencies 5-1
5.1.2 State, County, and Local Governmental Agencies 5-3
5.1.3 Consultation with Native Americans 5-3
5.1.4 Consultation with the California State Historic Preservation Officer 5-4
5.1.5 Partnerships 5-5
5.2 List of Preparers and Contributors 5-5

TABLE OF CONTENTS (CONT.)

FIGURES

3-1:	Planning Area Weekly Visitation FY04–FY08	3-115
3-2:	Planning Area 10-county Market Demand Area Population	3-140
3-3:	Employment by Sector	3-156

TABLES

ES-1:	Summary of Key Alternative Components	ES-5
1-1:	Planning Area Acreage (BLM acres)	1-1
1-2:	MUCs Assigned to ISD by the CDCA	1-10
2-1:	Management Actions for Vegetation Resources by Alternative	2-14
2-2:	Management Actions for Vegetative Use Authorization by Alternative	2-17
2-3:	Management Actions for Wildlife Resources by Alternative	2-21
2-4:	Management Actions for Special Status Species by Alternative	2-27
2-5:	Management Actions for Peirson's Milk-vetch by Alternative	2-29
2-6:	Use Allocations for Cultural Properties	2-39
2-7:	VRM Classes by Alternative	2-43
2-8:	ACECs by Alternative (acres)	2-47
2-9:	Management Actions for Special Designations by Alternative	2-48
2-10:	Potential Mineral Resource Decisions by Alternative	2-50
2-11:	Land Available for Geothermal Minerals Leasing by Alternative (acres)	2-54
2-12:	Recreation Management Actions by Alternative	2-60
2-13:	Recreation Management Zones by Alternative (acres)	2-63
2-14:	OHV Management Area Designations by Alternative	2-68
2-15:	Routes of Travel	2-70
2-16:	Lands and Realty Actions by Alternative	2-74
2-17:	Land Available for Solar Development by Alternative (acres)	2-86
2-18:	Land Available for Wind Energy Development by Alternative (acres)	2-86
2-19:	US–Mexico Border Access by Alternative	2-90
2-20:	Comparison of Impact by Alternative	2-93
3-1:	Ambient Air Quality Standards	3-7
3-2:	Priority Plant Species	3-22
3-3:	CNPS Species	3-23
3-4:	Invasive and/or Noxious Weeds Known or with the Potential to Occur in the Planning Area	3-24
3-5:	Additional Wildlife Species of Interest that Occur or Potentially Occur in the Planning Area	3-26
3-6:	Special Status Species	3-34
3-7:	Current Condition Classes based on Departures from Historical Fire Regimes	3-57
3-8:	Cultural Resource Projects within the Planning Area	3-69
3-9:	Planning Area Cultural Resource Summary	3-73
3-10:	Sites with Special Designation Areas	3-74
3-11:	Visual Resource Inventory Classification Matrix	3-83
3-12:	Visual Resource Management Objectives by Class	3-84
3-13:	VRM Classes Associated with the Multiple-use Classes Assigned to the Planning Area	3-85
3-14:	VRM Classes of OHV Recreation and Camping Areas	3-85

TABLE OF CONTENTS (CONT.)

TABLES (CONT.)

3-15:	Visual Resource Inventory Summary	3-94
3-16:	ACECs in the Planning Area	3-97
3-17:	Planning Area Visitation, FY2004–FY2008	3-113
3-18:	Documented Medical Aid Responses and Fatalities within Planning Area, FY2004–FY2008	3-129
3-19:	Total Citations within the Planning Area, FY2004–FY2008	3-130
3-20:	Total Arrests within the Planning Area, FY2004–FY2008	3-130
3-21:	BLM Rangers and Additional Law Enforcement Officers by Major Holiday Weekend, FY2004–FY2008	3-131
3-22:	Demographic Profile of the Planning Area Market Area v. California, Arizona, and the US	3-137
3-23:	Employment Growth Forecast for 2016	3-142
3-24:	Indicators of Community Economic Strength	3-144
3-25:	2006 Gross Domestic Product	3-151
3-26:	Distribution of Private Sector Employees	3-151
3-27:	Planning Area EIA Total Economic Value Added by Major Sector during 2007	3-154
3-28:	Breakdown of Expenditures by Visitors and Percentage of Visitor Dollars Spent in the Planning Area Region	3-159
3-29:	Baseline Economic Condition for Recreational Use of the Planning Area	3-159
3-30:	2007 IMPLAN Model Estimate of the Economic Impact from Recreational Activities for the Three-County EIA	3-160
3-31:	Baseline Economic Condition of Annual Roadway Maintenance Costs for ROWs within the Planning Area	3-161
3-32:	Baseline Economic Condition of Planning Area Utility Corridor Maintenance	3-163
3-33:	Baseline Economic Condition of Communication Sites and Facilities on BLM Land within the Planning Area	3-164
3-34:	Baseline Economic Condition for Apiary Activity within the Planning Area	3-165
3-35:	Baseline Economic Condition for Filming within the Planning Area	3-167
3-36:	Summary of the Baseline Economic Condition: Planning Area Total Cumulative Impact	3-168
4-1:	Potential Impacts to Resources by Alternative (acres)	4-3
4-2:	Federal *De Minimis* Thresholds for the Salton Sea Air Basin	4-4
4-3:	Estimated Annual Air Quality Emissions due to OHV Activity (tons/year)	4-5
4-4:	Estimated Incremental Change in CO_2 Emissions due to OHV Activity (tons/year)	4-7
4-5:	Vegetation Communities within Open/Closed/Limited OHV Recreation by Alternative (acres)	4-17
4-6:	Potential OHV Impacts to Peirson's Milk-vetch Critical Habitat by Alternative (acres)	4-33
4-7:	Potential Impacts to Visual Resource Management Class by Alternative (acres)	4-52
4-8:	Comparison of Visual Management Classes with Inventory Classes by Alternative (acres)	4-55
4-9:	Potential Impacts to Special Designations by Alternative (acres)	4-60
4-10:	Summary of Vehicle Estimates by Alternative	4-84
4-11:	Net Change in Economic Impacts by Alternative: Annual Recreation Activities within the Planning Area	4-85
4-12:	Net Change in Economic Impacts by Alternative: Apiary Permits and Annual Beehive Production within the Planning Area	4-90

TABLE OF CONTENTS (CONT.)

TABLES (CONT.)

4-13: Net Change in Economic Impacts by Alternative: Annual Total Activity within the Planning Area 4-92
5-1: List of Preparers and Contributors 5-5

APPENDICES

A: Results of Scoping A-1
B: The BLM Planning Process B-1
C: Typical Management Actions and Best Management Practices C-1
D: Monitoring Plan D-1
E: Rainfall Threshold Rationale E-1
F: Alternatives Comparison Tables F-1
G: Report on Selected Algodones Dunes Insects G-1
H: Report on Special Status Plant Species within the Planning Area H-1
I: Cooperative Fire Protection Agreement I-1
J: Cultural Resources Sites Recorded in the Planning Area by National Register Status J-1
K: Scenic Quality Field Inventory K-1
L: Authorized Land Uses / Status L-1
M: Rights-of-Way M-1
N: Environmental Database Results N-1
O: 2004–2007 Report: Potential Off-road Vehicle Impacts on Bird Populations within Microphyll Woodlands at the Algodones Dunes O-1
P: Reasonable Foreseeable Development Scenarios P-1

Glossary of Terms
Acronyms
References Cited

MAPS (UNDER SEPARATE COVER)

1-1: Planning Area
2-1: Visual Resource Management, Alternative 1
2-2: Visual Resource Management, Alternatives 2, 4, 5, 6 & 8
2-3: Visual Resource Management, Alternative 3
2-4: Visual Resource Management, Alternative 7
2-5: Special Designations, Alternatives 1 & 2
2-6: Special Designations, Alternatives 3, 4, 5, 6, 7 & 8
2-7: Lands Available for Geothermal Minerals Leasing, Alternatives 1, 2 & 7
2-8: Lands Available for Geothermal Minerals Leasing, Alternative 3
2-9: Lands Available for Geothermal Minerals Leasing, Alternative 4
2-10: Lands Available for Geothermal Minerals Leasing, Alternatives 5 & 6
2-11: Lands Available for Geothermal Minerals Leasing, Alternative 8
2-12: Special Recreation Management Areas (SRMA & ERMA), All Alternatives

TABLE OF CONTENTS (CONT.)

MAPS (UNDER SEPARATE COVER; CONT.)

2-13: Recreation Management Zones, Alternative 3
2-14: Recreation Management Zones, Alternative 4
2-15: Recreation Management Zones, Alternative 5
2-16: Recreation Management Zones, Alternative 6
2-17: Recreation Management Zones, Alternative 7
2-18: Recreation Management Zones, Alternative 8
2-19: OHV Management Areas, Alternative 1
2-20: OHV Management Areas, Alternative 2
2-21: OHV Management Areas, Alternative 3
2-22: OHV Management Areas, Alternative 4
2-23: OHV Management Areas, Alternative 5
2-24: OHV Management Areas, Alternative 6
2-25: OHV Management Areas, Alternative 7
2-26: OHV Management Areas, Alternative 8
2-27: Routes of Travel in the Planning Area
2-28: Utility Corridors and Communication Sites, All Alternatives
2-29: Lands Available for Solar Energy Development, Alternatives 1, 2 & 7
2-30: Lands Available for Solar Energy Development, Alternative 3
2-31: Lands Available for Solar Energy Development, Alternatives 4, 5 & 6
2-32: Lands Available for Solar Energy Development, Alternative 8
2-33: Lands Available for Wind Energy Development, Alternatives 1, 2 & 7
2-34: Lands Available for Wind Energy Development, Alternative 3
2-35: Lands Available for Wind Energy Development, Alternatives 4, 5 & 6
2-36: Lands Available for Wind Energy Development, Alternative 8
3-1: Vegetation Communities within the Planning Area
3-2: Peirson's Milk-vetch Critical Habitat
3-3: Mojave Desert Tortoise Critical Habitat
3-4: Flat-tailed Horned Lizard Management Area
3-5: Scenic Quality Rating Units within the Planning Area
3-6: Visual Resource Inventory Classes within the Planning Area
3-7: Special Designations within the Planning Area
3-8: Known Geothermal Resource Areas (KGRAs) within the Planning Area
3-9: Land Acquisitions within the Planning Area
3-10: Existing Land Withdrawals within the Planning Area
3-11: Solar Resource Potential within the Planning Area
3-12: Wind Energy Potential within the Planning Area

EXECUTIVE SUMMARY

Introduction

The Bureau of Land Management (BLM) has prepared this Draft Recreation Area Management Plan and Draft Environmental Impact Statement (DRAMP/DEIS) to provide direction for managing public lands administered by the El Centro Field Office and to analyze the environmental effects resulting from implementing the alternatives addressed in this document.

The overall Planning Area for this document encompasses the Imperial Sand Dunes Special Recreation Management Area, which includes the North Algodones Dunes Wilderness as well as a one-mile limited use area around the entire Imperial Sand Dunes Special Recreation Management Area, which is managed as an Extended Recreation Management Area. The Planning Area encompasses 214,930 acres and is located in eastern Imperial County, California, within the BLM California Desert Conservation Area. The Recreation Area Management Plan will be developed for federal surface and mineral estate managed by the El Centro Field Office within the Planning Area.

The DRAMP/DEIS was prepared in compliance with BLM's planning regulations Title 43 Code of Federal Regulations (CFR) 1600 under the authority of the Federal Land Policy and Management Act of 1976. This document also meets the requirements of the National Environmental Policy Act of 1969 (NEPA), the *Council on Environmental Quality Regulations for Implementing the NEPA* (40 CFR 1500-1508), and requirements of BLM's NEPA Handbook H-1790-1.

This document is also available on the Internet at www.blm.gov/en/fo/elcentro and on compact disc.

Purpose and Need

Currently, the El Centro Field Office manages resources within the Planning Area under portions of five different land use plans: *California Desert Conservation Area Plan* (1980), *Imperial Sand Dunes Recreation Area Management Plan* (1987), *Northern and Eastern Colorado Desert Coordinated Management Plan* (2002), *Western Colorado Desert Routes of Travel* (2003), and *Imperial Sand Dunes Recreation Area Management Plan* (2003). This DRAMP/DEIS combines the relevant portions of those documents and updates the plan with issues and concerns identified during the scoping process. The purpose is to provide direction that will guide future management actions for BLM-

administered lands within the Planning Area. The DRAMP/DEIS analyzes alternatives to resolve management issues, determines management objectives and actions, and establishes methods to facilitate multiple use and sustained yield management for the entire Planning Area.

Issues

The Notice of Intent to prepare the DRAMP/DEIS was published in the Federal Register on March 18, 2008. The El Centro Field Office held three public scoping meetings in April of 2008 and solicited comments. Resource specialists were present to answer questions, and attendees were encouraged to take extra information packages and comment forms, and distribute them to interested individuals that were not able to attend the meetings.

Comments were received from the public, agencies, organizations, and other interested stakeholders. Key issues identified included: designation of open and closed OHV recreation areas; allowable uses within the Planning Area; resource protection, particularly of the microphyll woodlands, plant and wildlife species, and cultural resources; law enforcement and public health and safety; hazardous materials management; and facilities management.

Alternatives

The basic goal of developing alternatives was to prepare different combinations of management to address issues and to resolve conflicts among uses. Alternatives must meet the purpose and need; must be reasonable; must provide a mix of resource protection, use, and development; must be responsive to the issues; and must meet the established planning criteria. Each alternative is a complete land use plan that provides a framework for multiple-use management of the full spectrum of resources, resource uses, and programs present in the Planning Area.

Two types of land use planning decisions are found under each topic for each alternative: Desired Future Conditions (resource goals and objectives) and Management Actions (prescriptions to help achieve management objectives).

Under all alternatives, the BLM will manage the public lands in accordance with all applicable laws, regulations, and BLM policy and guidance, and to meet Land Health Standards. A summary of the key resource management proposals in this DRAMP/DEIS are reflected by alternative at the end of this summary in Table ES-1.

Alternative 1 (No Action) describes the management conditions prescribed in the 1987 RAMP for the Planning Area. Alternative 1 provides an opportunity to compare the 1987

RAMP prescribed management with various strategies suggested to be analyzed for future management (Alternatives 2, 3, 4, 5, 6, 7 and 8). Alternative 1 will serve as the baseline for most resources and land use allocations.

Alternative 2 describes the continuation of the present management of the Planning Area based on plan updates developed in 2003. Alternative 2 provides an opportunity to compare the current management with various strategies suggested to be analyzed for future management.

Alternative 3 generally places emphasis on preservation of the Planning Area's natural and cultural resources through limited public use. It focuses on natural processes and other unobtrusive methods for natural resource use and management. It proposes fewer motorized and developed recreation opportunities than other alternatives.

Alternative 4 provides visitors with opportunities to experience natural and cultural resource values of the Planning Area. It emphasizes a combination of natural processes and active management techniques for recreation and use management. The alternative includes management decisions that would provide a balance of multiple uses. Alternative 4 identifies a higher level of preservation and a lower level of motorized use, recreation opportunities, and renewable development than Alternatives 5 and 6.

Alternative 5 provides visitors with opportunities to experience natural and cultural resource values of the Planning Area. It emphasizes a combination of natural processes and active management techniques for recreation and use management. The alternative includes management decisions that would provide a balance of multiple uses. Alternative 5 identifies more moderate level of preservation and moderate level of motorized use, recreation opportunities, and renewable development than Alternatives 4 and 6.

Alternative 6 provides visitors with opportunities to experience natural and cultural resource values of the Planning Area. It emphasizes a combination of natural processes and active management techniques for recreation and use management. The alternative includes management decisions that would provide a balance of multiple uses. Alternative 6 identifies a lower level of preservation and a higher level of motorized use, recreation opportunities, and renewable development than Alternatives 4 and 5.

Alternative 7 generally places an emphasis on consumer-driven uses and the widest array of uses, such as renewable energy, transportation, and utility rights-of-way, and enhanced recreational opportunities (including motorized use). It identifies areas most appropriate for these various uses. It places a greater emphasis on developed and motorized recreation opportunities and a lesser emphasis on remote settings and primitive recreation.

Alternative 8 (Preferred Alternative) provides for management of each resource and resource use by establishing a balance between authorized resource use and the protection and long-term sustainability of sensitive resources. It allows visitation and development within the Planning Area, while ensuring that resource protection is not compromised in accordance with the principles of multiple use and sustained yield as mandated by Federal Land Policy and Management Act. The proposed decisions under this alternative could be identical to those under one of the other alternatives presented or could be a combination of features from several of the other alternatives.

Government and Public Involvement

BLM continued collaboration efforts by including communities in the formulation and development of alternatives. The scoping meetings gave the public an opportunity to provide input for the BLM to consider in refining the issues to be addressed, discuss visions for BLM lands, and begin exploring alternative ways to manage BLM lands and resources in the Planning Area. Input received from the public (both groups and individuals) was considered in developing the alternatives. The public comments and issues were considered in the range of alternatives and analyzed in the EIS, as required by NEPA.

The DRAMP/DEIS was developed with coordination and cooperation from the following agencies: California Department of Fish and Game, California State Historic Preservation Office, and United States Fish and Wildlife Service. The United States Border Patrol, El Centro Sector, and Imperial County Planning Department are participating as cooperating agencies. BLM also consulted with Indian tribes who have oral traditions or cultural concerns relating to the Planning Area, or who are documented as having occupied or used portions of the Planning Area during historic times.

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Rangeland Health Standards Management							
Continue to utilize existing national fallback standards for grazing allotments.	Adopt the regional standards for rangeland health: 1. Maintain soils that exhibit infiltration and permeability rates that are appropriate to soil type, climate, geology, landform, and past uses. 2. Maintain wetland systems associated with subsurface and properly running and standing water function that have the ability to recover from major disturbances. Maintain also hydrologic conditions. 3. Promote healthy, productive, and diverse habitats for native species, maintaining special status species in places of natural occurrences. 4. Meet state and federal standards for water quality, including exemptions allowable by law						
Air Resources Management							
Comply with the State of California for all proposed actions that would contribute to particulate matter emissions in the air as a result of actions taken.							
Evaluate impacts of activities within the Planning Area to air quality non-attainment. Implement BLM dust control plan to improve air quality as required by the ICAPCD.							
Soil Resource Management							
Minimize surface disturbance from authorized activities.							
Incorporate erosion control measures into projects on a case-by-case basis.							
Manage vegetation to minimize erosion and maintain natural dune structure.							
Water Resources Management							
Continue to maintain or improve water quality in accordance with state and federal standards. Consult with the appropriate state agencies on proposed projects that may significantly affect water quality.							
Maintain authorized vehicle routes in a manner that will promote natural hydrology and protect water quality through application of BMPs.							

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Vegetative Resource Management							
	Encourage enforcement of existing administrative vehicle closures.	Classify microphyll woodlands as exclusion areas[1] for all commercial and non-commercial surface-disturbing activities.	Classify microphyll woodlands as avoidance areas[2] for all commercial and non-commercial surface-disturbing activities.				Classify microphyll woodlands as avoidance areas[2] for all commercial and non-commercial surface-disturbing activities.
Wildlife Resource Management							
Restore native species habitat distribution and occurrence (especially for priority species), conserve biological diversity, maintain genetic integrity and exchange, and improve availability of suitable habitats and habitat linkages. Initiate restoration activities in priority habitats, such as invasive weed removal or native seeding, to move toward desired habitat conditions and provide functional landscapes to sustain populations of fish and wildlife species. Wildlife habitat improvement projects for the Planning Area would be implemented in coordination with CDFG, pursuant to Section 103(f) of the CDPA of 1994							
Special Status Species Management							
		Close camping within Mojave desert tortoise habitat and BLM sensitive species habitat.	Limit motorized use (within corridors or routes) within Mojave desert tortoise habitat and BLM sensitive species west of the UPRR tracks.				

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Special Status Species Management (cont.)							
Open some areas of PMV critical habitat (existing and future designated) to motorized use and close other areas of critical habitat to motorized use.	Open some areas of PMV critical habitat (existing and future designated) to motorized use and close other areas of critical habitat to motorized use.	Close PMV critical habitat (existing and future designated) to motorized use.	Open some areas of critical habitat (existing and future designated) to some limited motorized use (seasonal closures, nighttime closures).	Close PMV critical habitat (existing and future designated) to motorized use.	Open some areas of PMV critical habitat (existing and future designated) to motorized use and close other areas of critical habitat to motorized use.	Open some areas of PMV critical habitat (existing and future designated) to motorized use and close other areas of critical habitat to motorized use.	Close PMV critical habitat (existing and future designated) to motorized use. Close Dunebuggy Flats campground to camping, if rainfall threshold is met for PMV Critical Habitat.
	Classify PMV critical habitat as an avoidance area[2] for solar and wind energy development, as well as all other types of land use authorization.	Exclude PMV critical habitat from solar and wind energy development, as well as all other types of land use authorization.	Classify PMV critical habitat as an avoidance area[2] for solar and wind energy development, as well as all other types of land use authorization.			Open PMV critical habitat to solar and wind energy development as well as all other types of land use authorization.	Exclude PMV critical habitat from solar and wind energy development as well as all other types of land use authorization.

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Wildland Fire Management							
Utilize wildland fire suppression methods with lesser ground disturbance to minimize potential adverse impacts on special status species, critical habitat, desired plant communities, and cultural resources.							
Apply the minimum impact suppression tactics, identified in the Interagency Standards for Fire and Aviation Operations, in the WA, when wildland fire suppression is required.							
Cultural Resource Management							
Existing decisions of the RAMP would continue to be implemented.	Manage cultural resources in accordance with existing laws, regulations, EOs, and SHPO protocol agreements (as amended).						
Paleontological Resource Management							
Evaluate paleontological resources as they are discovered, considering their scientific, educational, and recreational values. Identify appropriate objectives, management actions, and allowable uses for fossil localities as they are found.							
Visual Resource Management							
Class I: 26,098 acres[3]							
Class II: 71,758 acres	Class II: 104,604 acres	Class II: 173,214 acres	Class II: 104,604 acres			Class II: 15,896 acres	Class II: 104,604 acres
Class III: 37,782 acres	Class III: 68,610 acres	Class III: 15,039 acres	Class III: 68,610 acres			Class III: 88,708 acres	Class III: 68,610 acres
Class IV: 28,571 acres	Class IV: 15,039 acres	Class IV: 0 acre	Class IV: 15,039 acres			Class IV: 83,649acres	Class IV: 15,039 acres

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

<table>
<tr><th>Alternative 1</th><th>Alternative 2</th><th>Alternative 3</th><th>Alternative 4</th><th>Alternative 5</th><th>Alternative 6</th><th>Alternative 7</th><th>Alternative 8</th></tr>
<tr><td colspan="8">Special Designations</td></tr>
<tr><td colspan="8">North Algodones Dunes Wilderness Area: 26,098 acres</td></tr>
<tr><td colspan="8">Plank Road ACEC: 298 acres</td></tr>
<tr><td colspan="2">East Mesa ACEC: 6,454 acres</td><td colspan="6">East Mesa ACEC: 5,799 acres</td></tr>
<tr><td colspan="2">North Algodones Dunes ACEC: 25,756 acres</td><td colspan="6">North Algodones Dunes ACEC: 0 acre</td></tr>
<tr><td></td><td>Classify ACECs as avoidance areas[2] for solar and wind energy development.</td><td>Exclude ACEC(s) from solar and wind energy development.</td><td colspan="3">Classify ACECs as avoidance areas[2] for solar and wind energy development. Classify ACECs as avoidance areas[2] for all land use authorizations other than for solar and wind development.</td><td>Open ACECs to solar and wind energy development.</td><td>Exclude ACEC(s) from solar and wind energy development.</td></tr>
<tr><td colspan="8">Mineral Resource Management</td></tr>
<tr><td colspan="8">Locatable</td></tr>
<tr><td colspan="2">Maintain ISD SRMA—excluding the WA, and ACEC(s)—as open to mineral entry under the Mining Law, subject to Section 7 and Section 106 consultations.</td><td>Propose withdrawal of the ISD SRMA, ACEC(s), and critical habitat from mineral entry.</td><td colspan="3">Propose withdrawal of the ACEC(s) and critical habitat from mineral entry.

Maintain the ISD SRMA—excluding the WA—as open to mineral entry under the Mining Law, subject to Section 7 and Section 106 consultations.</td><td colspan="2">Maintain ISD SRMA—excluding the WA, and ACEC(s)—as open to mineral entry under the Mining Law, subject to Section 7 and Section 106 consultations.</td></tr>
</table>

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Leasable							
Open the entire Planning Area, with the exclusion of the WA, to geothermal minerals leasing and surface occupancy.		Prohibit geothermal minerals leasing within the entire Planning Area.	Open the entire Planning Area, with the exclusion of the WA, to geothermal minerals leasing, but with an NSO stipulation.	Allow geothermal mineral leasing on nominated lands under 43 CFR 3203.10.		Open the entire Planning Area, with the exclusion of the WA, to geothermal minerals leasing and surface occupancy.	Exclude ISD SRMA and donated lands from geothermal minerals leasing.
Available acres for geothermal leasing: 188,426		Available acres for geothermal leasing: 0		Available acres for geothermal leasing: 11,939		Available acres for geothermal leasing: 188,426	Available acres for geothermal leasing: 35,115
Saleable							
	Allow mineral sales or free use permits within the ISD SRMA.	Prohibit mineral sales or free use permits within the ISD SRMA.	Allow mineral sales or free use permits within the ISD SRMA.				Prohibit mineral sales or free use permits within the ISD SRMA.
Recreation Resource Management							
		Open RMZ acres: 74,676	Open RMZ acres: 105,843	Open RMZ acres: 103,839	Open RMZ acres: 108,914	Open RMZ acres: 125,710	Open RMZ acres: 127,416
		Resource Protection RMZ acres: 61,680	Resource Protection RMZ acres: 29,122	Resource Protection RMZ acres: 32,516	Resource Protection RMZ acres: 27,441	Resource Protection RMZ acres: 10,645	Resource Protection RMZ acres: 9,046
		Limited RMZ acres: 52,477	Limited RMZ acres: 53,868	Limited RMZ acres: 52,477			Limited RMZ acres: 52,370

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Recreation Resource Management (cont.)							
		North Algodones Dunes Wilderness RMZ acres: 26,098					
Open OHV acres: 120,393	Open OHV acres: 87,713	Open OHV acres: 74,676	Open OHV acres: 105,843	Open OHV acres: 103,839	Open OHV acres: 108,914	Open OHV acres: 125,710	Open OHV acres: 127,416
Closed OHV acres: 26,098	Closed OHV acres: 75,322	Closed OHV acres: 87,778	Closed OHV acres: 55,220	Closed OHV acres: 58,614	Closed OHV acres: 53,539	Closed OHV acres: 36,743	Closed OHV acres: 35,144
Limited OHV acres: 68,440	Limited OHV acres: 51,896	Limited OHV acres: 52,477	Limited OHV acres: 53,868	Limited OHV acres: 52,477			Limited OHV acres: 52,370
Transportation and Public Access							
Allow general vehicle travel only on routes designated for motorized vehicles. Emergency vehicles may utilize a drivable wash to access a site. Where no roads exist, vehicles could be authorized on a case-by-case basis to travel cross-country to avoid the need for road building. Where new roads must be built, roadbeds would be no wider than needed for reliable access; BLM specifications would also be used to reduce erosion.							
Lands and Realty Management							
Allow apiary permits on a case-by-case basis within strategically located sites to limit interaction with the public.		Prohibit apiary permits in the Planning Area.	Allow apiary permits on a case-by-case basis within strategically located sites to limit interaction with the public.				

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Lands and Realty Management (cont.)							
	PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs would be avoidance areas[2] for solar and wind energy development.	PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACEC(s) would be exclusion areas[1] for solar and wind energy development.	PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs would be avoidance areas[2] for solar and wind energy development.			PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs would be available for solar and wind energy development.	PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACEC(s) would be exclusion areas[1] for solar energy development.
	PMV critical habitat would be an avoidance area[2] for all other types of land use authorization.	PMV critical habitat would be an exclusion area[1] for all other types of land use authorization.	PMV critical habitat would be an avoidance area[2] for all other types of land use authorization.			PMV critical habitat would be available for all other types of land use authorization.	PMV critical habitat would be an exclusion area[1] for all other types of land use authorization.
Entire Planning Area would be available for solar and wind energy development (with exception of WA).						Entire Planning Area would be available for solar energy development (with exception of WA).	

TABLE ES-1
SUMMARY OF KEY ALTERNATIVE COMPONENTS (CONT.)

Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Lands and Realty Management (cont.)							
Acres available for solar and wind energy development: 188,833		Acres available for solar and wind energy development: 47,131	Acres available for solar and wind energy development: 39,694			Acres available for solar and wind energy development: 188,833	Acres available for solar and wind energy development: 35,115
Avoidance acres[2] for solar and wind energy development: 0			Avoidance acres[2] for solar and wind energy development: 144,290			Avoidance acres[2] for solar and wind energy development: 0	
Acres excluded[1] from solar and wind energy development: 0		Acres excluded[1] from solar and wind energy development: 141,702	Acres excluded[1] from solar and wind energy development: 4,847			Acres excluded[1] from solar and wind energy development: 0	Acres excluded[1] from solar and wind energy development: 153,717
Public Health and Safety							
Maintain area adjacent to the US–Mexico border as open to public use and continue voluntary compliance through public education and cooperation with USBP to enhance public safety.		Close area within 100 feet of the US-Mexico border to public use.	Close Roosevelt Reservation area (60 feet) adjacent to the US–Mexico border to public use.			Maintain area adjacent to the US-Mexico border as open to public use and continue voluntary compliance through public education and cooperation with USBP to enhance public safety.	

[1] Exclusion area is defined as an area that is not available for discretionary land-use authorizations.
[2] Avoidance area is defined as an area only available for discretionary land-use authorizations when there are no other reasonable alternatives for the authorization.
[3] The acreages identified for VRM Class I represent the digital boundaries of the WA. These acreages may not coincide completely with those designated by Congress.

THIS PAGE IS INTENTIONALLY BLANK.

CHAPTER 1.0
Introduction

The Bureau of Land Management (BLM) El Centro Field Office (ECFO) is developing a Recreation Area Management Plan (RAMP) for the Imperial Sand Dunes (ISD). The overall Planning Area for this document encompasses the ISD Special Recreation Management Area (SRMA), which includes the North Algodones Dunes Wilderness, as well as a one-mile limited use area around the entire ISD SRMA (Table 1-1, Map 1-1). The one-mile limited use area is currently managed as an Extended Recreation Management Area (ERMA); BLM lands outside of SRMAs must be managed as ERMAs. The Planning Area is located in eastern Imperial County, California, and within the California Desert Conservation Area. The RAMP will be developed for federal surface and mineral estate managed by the ECFO within the Planning Area (Map 1-1).

TABLE 1-1
PLANNING AREA ACREAGE (BLM Acres)

Description	BLM-administered Acres
ISD SRMA (excluding North Algodones Dunes Wilderness)	138,111
North Algodones Dunes Wilderness	26,098
One-mile Limited Use Area ERMA around the ISD SRMA	50,722
Total Acres in ISD Planning Area	214,930

The BLM has determined that an Environmental Impact Statement (EIS) is necessary for the analysis of the RAMP, consistent with the National Environmental Policy Act of 1969 (NEPA). This document follows the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 Code of Federal Regulations [CFR] 1500-1508) and BLM's NEPA Handbook (H-1790-1).

The United States (US) Department of the Interior (DOI) BLM ECFO is the lead agency for the RAMP/EIS and has approval or disapproval authority over the description of the proposed action and alternatives, format and analysis of the RAMP/EIS, stakeholder collaboration, public involvement procedures, and decision.

The BLM must comply with all applicable federal laws, regulations, and agency policies when addressing a wide variety of issues and analyzing a reasonable range of alternatives for the BLM-administered lands and resources within the Planning Area.

The Planning Area contains the largest mass of sand dunes in California, covering an area more than 40 miles long and averaging 5 miles in width. The Planning Area is considered a world-class off-highway-vehicle (OHV) area, and it represents one of the most popular OHV areas in the western US. It is a well-known area to local residents and the thousands who visit each year from the southwestern US and beyond. The Planning Area is the most intensively used OHV recreation area within the BLM California Desert District (CDD), with over 1.4 million OHV visitors per year. In addition, the Planning Area is recognized for its frequent use as a backdrop for commercials and movies because of its unique beauty and landscape. The Planning Area is also recognized for providing unique habitat for several endemic and sensitive plant, insect, and animal species.

Because of the overwhelming popularity and regional importance of the Planning Area to visitors, recreational enthusiasts, and others, the ISD requires careful management to protect its recreational, natural, and cultural resources. As the designated steward of the ISD, the BLM is charged with the responsibility to oversee and manage this ecologically complex and beautiful public treasure. The RAMP will be developed as a tool for long-range planning and management oversight of these important resources.

1.1 Purpose of and Need for Action

This RAMP, which updates the 1987 ISD RAMP, has been designed to provide a variety of sustainable OHV and other recreational activities, and to maintain or improve the conditions of the special status species and other unique natural and cultural resources, while creating an environment to promote the health and safety of visitors, employees, and nearby residents.

1.1.1 Purpose

The primary purpose of an EIS is to serve as an action-forcing device to ensure that the policies and goals defined in NEPA are infused into the federal programs and actions.

The BLM seeks to provide a comprehensive management plan to address management of the Planning Area, manage the Planning Area for recovery and delisting of the Peirson's milk-vetch (PMV; *Astragalus magdalenae var. peirsonii*) and Mojave desert tortoise (*Gopherus agassizii*), provide protection to special status species, and prevent additional listings while providing a world-class recreational experience to visitors. Whether that recreational experience means traversing a sand dune on an OHV, watching migratory birds gather in the microphyll woodlands, or camping under the stars in the North Algodones Dunes Wilderness, BLM must manage for a diverse range of recreation within the Planning Area.

1.1.2 Need

The BLM is managing the Planning Area according to an RAMP and various assorted management prescriptions that need to take account of new information, resource conditions, and policy and court findings. Court-ordered interim closures have also been retained by BLM and need to be considered in a revised plan for the Planning Area (see Section 1.3 below for a discussion of court-ordered closures).

Continued population growth in the urban and non-urban areas and shifting demographic patterns in southern California and Arizona have increased the demand for outdoor recreation within the Planning Area and nearby areas. Management challenges continue, with BLM striving to encourage appropriate recreational use and discourage inappropriate use, while respecting the freedom of visitors to enjoy recreation within the Planning Area. The BLM has also acquired many new data sources which will aid in the development of the RAMP (see Section 1.5.1.10).

1.2 Planning Area

The Planning Area for the evaluation conducted in this EIS encompasses the ISD SRMA and the one-mile Limited Use Area ERMA. The Limited Use Area ERMA is currently managed under two other BLM plans: the *Northern and Eastern Colorado Desert Coordinated Management Plan* (NECO) and the *Western Colorado Desert Routes of Travel Designation* (WECO). Although not a part of the ISD SRMA, this Limited Use Area ERMA is included as a part of the Planning Area.

The Planning Area comprises approximately 214,930 acres of BLM-administered land in Imperial County, California, covering an area more than 40 miles long and averaging 5 miles in width. The regional setting of the Planning Area is shown in Map 1-1.

The primary activities in the Planning Area include OHV recreation and camping. A permit is required at all times while within the Planning Area (which is the entire fee area), and includes the ISD SRMA and Limited Use Area ERMA. The fee area includes, but is not limited to Buttercup, Gecko Road, Glamis, Gordon's Well/Dunebuggy Flats, Mammoth Wash, Ogilby, Osbourne, along both sides of the Coachella Canal, and Ted Kipf Road (see Map 1-1). The ISD SRMA consists of a typical sand dune habitat with the larger dunes found in the central portion of the Planning Area. Microphyll woodlands can be found on the eastern edge of the sand dunes and comprise several species, including palo verde, mesquite, and ironwood.

1.3 Scoping/Issues

One of the earliest ways to include the public in the NEPA process is through scoping. The CEQ regulations define scoping as an "early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." In this case, scoping began with a Notice of Intent (NOI) to Prepare an Amendment to the California Desert Conservation Area (CDCA) Plan and EIS which was published in the *Federal Register* on March 18, 2008.

1.3.1 Public Scoping

The formal public scoping period began March 18, 2008 and closed on May 30, 2008. A press release announcing the time and location of the three initial public scoping meetings was sent out on April 4, 2008.

Public scoping meetings were held in San Diego, California; Phoenix, Arizona; and El Centro, California, on April 22, 23, and 24, 2008, respectively. Members of the public attended all three meetings at which time BLM invited participants to submit scoping comments. Resource specialists were present to answer questions and assist in clarifications for the public. During the meetings, attendees were encouraged to take extra information packages and comment forms, and distribute them to interested individuals who were not able to attend the meetings.

Several key issues were identified during the scoping process that have been incorporated into the planning process and that will be addressed in the development of alternatives for the proposed action. These issues include:

- Identification of areas open and closed to motorized OHV recreation
- Identification of other allowable uses within the Planning Area
- Resource protection (microphyll woodland communities, plants, wildlife, cultural resources)
- Law enforcement/public health and safety
- Solid waste/hazardous materials management
- Facilities management

BLM contacted nine tribal entities to initiate government-to-government consultation or solicit information about issues of concern for the RAMP. BLM will continue contact with all tribes interested in this planning process.

During the scoping period, BLM received approximately 30 comment letters. Public comments addressed a variety of issues and concerns regarding recreation and resources, as well as management considerations. See Appendix A (Results of Scoping) for details on the issues and concerns that were raised by the public.

1.3.2 Planning Issues

The BLM's *Land Use Planning Handbook* defines planning issues as "disputes or controversies about existing and potential land and resource allocations, levels of resource use, production, and related management practices" (BLM 2005a). Issues identified during scoping for this RAMP revision process comprise two categories:

- Issues within the scope of the EIS that are used to develop alternatives or are otherwise addressed in the EIS
- Issues outside the scope of the EIS or that could require policy, regulatory, or administrative actions

Those planning issues determined to be within the scope of the EIS are used to develop one or more of the alternatives or are addressed in other parts of the EIS. A reasonable range of alternatives provides various scenarios describing how BLM and cooperating agencies can address key planning issues, including the management of recreation and resource uses in the Planning Area. In other words, key planning issues serve as the rationale for alternative development. The key planning issues identified in the scoping report were:

- Identification of areas that are open and closed to OHV recreation
- Re-evaluation of the need for an Adaptive Management Area
- Re-evaluation of the need for administrative closures to protect biological resources
- Management of the commercial vending program
- Management of the fee program
- Identification of allowable uses within each area of the Planning Area
- Identification of how BLM intends to carry out resource protection (e.g., microphyll woodlands, invertebrates, plants, and cultural resources)

In addition, BLM will address climate change in this document. As appropriate, this plan describes: 1) the effects that a changing climate may have on the resources in the Planning Area and 2) how the reasonably foreseeable activities under each alternative would affect climate change.

1.4 Planning Criteria/Legislative Constraints

Defining the planning issues and planning criteria represents the first step in narrowing the scope of the RAMP revision. The planning issues and planning criteria provide the framework in which RAMP decisions are made and refer to what is established or determined by the final (approved) RAMP. The RAMP will provide land use plan decisions for the following categories:

- Physical, biological, and heritage resources
- Resource uses and support
- Special designations

In the context of these categories, the planning team develops management strategies aimed at providing viable options for addressing planning issues. The management strategies provide the building blocks from which general management scenarios and, eventually, the more detailed recreation area management alternatives are developed. The recreation area management alternatives reflect a reasonable range of management options that fall within limits set by the planning criteria. The planning issues and planning criteria used to revise the existing plan are described in the following sections.

1.4.1 Planning Criteria

Planning criteria are the standards, rules, and guidelines that help guide the RAMP process. These criteria influence all aspects of the planning process including inventory and data collection, development of issues to be addressed, formulation of alternatives, estimation of impacts, and selection of the Preferred Alternative. In conjunction with the planning issues, these criteria ensure that the planning process is focused and incorporates appropriate analyses. Planning criteria are developed from appropriate laws, regulations, and policies. The criteria also help guide the final plan selection and are used as a basis for evaluating the responsiveness of the planning options. Additional planning criteria can be added at any point in the planning process.

The following are the planning criteria utilized for this document:

- The plan will be completed in compliance with Federal Land Policy and Management Act (FLPMA, NEPA), and all other relevant federal laws, Executive Orders (EOs), and management policies of the BLM.
- The planning process will include an EIS that will comply with NEPA standards.

- The plan will set forth a framework for managing recreational activities in order to maintain existing natural landscapes and critical habitat for the threatened PMV, as well as provide for the enjoyment and safety of the visiting public.
- Where existing planning decisions are still valid, those decisions may remain unchanged and be incorporated into the new RAMP.
- The plans will recognize valid existing rights.
- Native American tribal consultations will be conducted in accordance with policy, and tribal concerns will be given due consideration. The planning process will include the consideration of any impacts on Indian trust assets.
- Consultation with the State Historic Preservation Officer (SHPO) will be conducted throughout the plan.
- Consultation with US Fish and Wildlife Service (USFWS) will be conducted throughout the plan.

1.4.2 Laws, Regulations, and Executive Orders

The BLM planning process is governed by the FLPMA of 1976 and the BLM Planning Regulations in 43 CFR Part 1600. Land use plans ensure that public land is managed in accordance with the intent of Congress as stated in FLPMA, under the principles of multiple use and sustained yield. As required by FLPMA,

> public lands must be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition, that will provide food and habitat for fish, wildlife, and domestic animals; and that will provide for outdoor recreation and human occupancy and use by encouraging collaboration and public participation throughout the planning process.

In addition, public lands must be managed in a manner that recognizes the nation's need for domestic sources of minerals, food, timber, and fiber. Land use plans are the primary mechanism for guiding BLM activities to achieve the agency's mission and goals.

The BLM *Land Use Planning Handbook* provides guidance for preparing land use plans, including specific guidance for each program and resource (BLM 2005a).

In addition to FLPMA, NEPA, and their associated regulations, BLM must comply with the mandate and intent of all federal laws (and any applicable regulations) and EOs that apply to BLM-administered lands and resources in the Planning Area. While many laws

may appear to be in conflict with others, the RAMP/EIS process is intended to develop land use plan decisions that resolve such conflicts and meet the multiple-use and sustained-yield mandate of FLPMA.

1.5 Planning Process

Development of a land use plan is a major federal action for the BLM. The BLM planning process is outlined in Appendix B. Pursuant to NEPA, federal agencies are required to prepare an EIS for major federal actions. This EIS accompanies the revision of the existing plan and will analyze the impacts of all alternatives considered including the No Action Alternative, as required by NEPA.

The ECFO met individually with several government agencies surrounding the Planning Area to discuss the planning process. The ECFO facilitated discussions with the agencies, which generated issues and concerns that are documented in the *Imperial Sand Dunes Recreation Area Scoping Report* (BLM 2008b) on file at the ECFO.

The BLM coordinates and consults with the SHPO concerning cultural resources within the Planning Area. The BLM has a national Memorandum of Agreement (MOA) with the USFWS to cooperate on Section 7 Consultation for the Endangered Species Act (ESA). The California Department of Fish and Game (CDFG) has a statewide Memorandum of Understanding (MOU) with BLM and would use this agreement to work collaboratively with the ECFO. Numerous federal, state, and local agencies and tribal interests were identified by the BLM ECFO at the outset of this RAMP effort, and these entities were contacted in writing to determine their interest in serving as cooperators on this RAMP. To date, the US Border Patrol, El Centro Sector, and Imperial County Planning Department have requested cooperating agency status for the RAMP/EIS planning effort.

Public meetings were conducted during the initial public scoping period on April 22, 23, and 24, 2008, in San Diego, California; Phoenix, Arizona; and El Centro, California; respectively. The ECFO staff distributed comment sheets, encouraged the public to submit scoping comments, and conducted presentations when requested. These public meetings were held to gain public input on identifying issues, concerns, and alternatives to be addressed in the RAMP. Information gathered by the BLM at these meetings has been incorporated into this Draft RAMP/Draft EIS (DRAMP/DEIS).

This DRAMP/DEIS describes eight alternatives, including the Preferred Alternative, to address the various combinations of public land uses and resource management practices within the Planning Area. This chapter, Chapter 1, describes the purpose and need for the plan, the role of BLM, and public participation in the planning process. Chapter 2 provides a description of each alternative. Chapter 3 describes the affected environment in the Planning Area. Chapter 4 describes potential direct, indirect, and

cumulative effects associated with each alternative. Chapter 5 describes the consultation and coordination efforts for the DRAMP.

1.5.1 Relationship to Policies, Plans, and Programs

Implementation of a revised management plan for public lands is subject to numerous laws and regulations, as well as a general requirement for consistency with pre-existing and applicable plans. The following sections summarize the most pertinent policies, plans, and programs that affect the planning processes for the Planning Area.

1.5.1.1 Federal Land Policy and Management Act

Pursuant to the FLPMA of 1976, 43 United States Code (USC) 1701 et seq., the BLM is directed to manage the public lands and their resources on the basis of multiple use and sustained yield principles. As required by FLPMA, public lands must be managed in a manner that: protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; would preserve and protect, where appropriate, certain public land in their natural condition; that would provide food and habitat for fish, wildlife, and domestic animals; and that would provide for outdoor recreation and human occupancy and use by encouraging collaboration and public participation throughout the planning process. In addition, public land must be managed in a manner that recognizes the nation's need for domestic sources of minerals, food, timber, and fiber from public land. Land use plans are the primary mechanism for guiding BLM activities to achieve the BLM's mission and goals.

1.5.1.2 California Desert Conservation Area Plan 1980

The CDCA encompasses 25 million acres of land in southern California that were designated by Congress in 1976 through FLPMA. The BLM directly administers approximately 10 million acres of the CDCA. With the designations in the CDCA, Congress directed the BLM to prepare and implement a comprehensive, long-range plan for the management, use, development, and protection of public lands within the CDCA. The 1980 CDCA Plan, as amended, is based on the concepts of multiple use, sustained yield, and maintenance of the environmental quality. The CDCA Plan provides overall regional guidance for management of the public lands in the CDCA, and establishes long-term goals for protection and use of the California desert. The CDCA Plan established four multiple-use class (MUC) guidelines and plan elements for specific resources or activities such as motorized-vehicle access, recreation, and vegetation. These MUCs are:

- Class C (Controlled Use): These lands are to be preserved in a natural state; and access generally is limited to non-motorized, non-mechanized means (e.g., by foot or horseback).

- Class L (Limited Use): These lands are managed to protect sensitive, natural, scenic, ecological, and cultural resource values. They provide for generally lower intensity and carefully controlled multiple uses that do not significantly diminish resource values.

- Class M (Moderate Use): These lands are managed in a controlled balance between higher intensity use and protection. A wide variety of uses, such as mining, livestock grazing, recreation, and energy and utility development are allowed. Any damage caused by permitted uses must be mitigated.

- Class I (Intensive Use): These lands are managed for concentrated use to meet human needs. Reasonable protection is provided for sensitive natural values, and mitigation of impacts and rehabilitation of impacted areas will occur when possible.

The Planning Area contains all four MUCs, as described in Table 1-2 below.

TABLE 1-2
MUCs[1] ASSIGNED TO ISD BY THE CDCA

MUC C	MUC L	MUC M	MUC I
North Algodones Dunes Wilderness	Dunebuggy Flats Area	Glamis Area	Mammoth Wash Area
	Large Central Portion of the ISD		Buttercup Area
	Ogilby Area		Gecko Area

[1] CDCA listings

The CDCA Plan also includes an Area of Critical Environmental Concern (ACEC) designation to protect sensitive cultural and natural resources. The Planning Area includes three ACECs. The Plank Road ACEC, located in the southern portion of the Planning Area, contains a portion of the historic Plank Road. The East Mesa ACEC, located on the west side of the Planning Area and near Gordon's Well, was designated as an ACEC to protect habitat for the flat-tailed horned lizard (*Phrynosoma mcallii*), which was proposed for listing under the federal ESA as a threatened species, but later withdrawn from consideration. The flat-tailed horned lizard is currently listed as a BLM sensitive species and is managed under the *Flat-tailed Horned Lizard Range-wide Management Strategy* (Flat-tailed Horned Lizard Interagency Coordinating Committee 2003). The North Algodones Dunes ACEC, located within the North Algodones Dunes Wilderness, was designated by the CDCA Plan Amendment 13 in 1989/1990, prior to its 1994 designation as a wilderness area (WA).

Since 1980, the CDCA Plan has been amended periodically to reflect changing conditions, including the acquisition of new knowledge relating to natural resources, and to update management strategies. Among these amendments is the 1987 ISD RAMP.

The current effort to update the RAMP for the Planning Area could change certain parts of the CDCA Plan. Some of these changes could include establishing new or modified areas as open, limited, or closed to OHV use and changing the MUCs for certain areas. Such changes would require an amendment to the CDCA Plan in accordance with BLM planning regulations, Part 43, CFR, Subpart 1610.3-2.

1.5.1.3 California Desert Protection Act

The California Desert Protection Act (CDPA) of 1994 (Public Law 103-433) created new WAs on federal lands in the CDCA, transferred considerable acreage from BLM to National Park Service management, changed the status of several former monuments and preserves to national parks, and created several special designations for wildlife sanctuaries and ACECs. The enactment of the CDPA formally established 26,098 acres of BLM-administered lands in the Planning Area as the North Algodones Dunes Wilderness.

Prior to passage of the CDPA, BLM studied both the North Algodones and South Algodones wilderness study areas (WSAs) for possible wilderness designation under Section 603 of FLPMA. On January 3, 1989, Senator Alan Cranston proposed these WSAs, along with 69 other areas of the CDCA, to be designated as wilderness in Senate Bill 11. The bill did not pass and was reintroduced by Senator Dianne Feinstein in 1993 as Senate Bill 21. Senator Feinstein, in a February 23, 1994, correspondence to her Senate colleagues asking for their support for the Bill, stated that she wanted to "drop the entire 61,630-acre South Algodones Dunes from the Bill to allow for vehicle use."

On October 31, 1994, the CDPA was signed into law. The Act designated the 26,098-acre North Algodones Dunes as wilderness to be managed by BLM as a part of the National Wilderness Preservation System. No wilderness was designated for the South Algodones Dunes in the Act. Congress also indicated in the CDPA that the South Algodones Dunes WSA had been adequately studied for wilderness designation pursuant to Section 603 of FLPMA, and would be released from WSA status. Since conditions relating to the wilderness values of the South Algodones Dunes have not changed since the 1994 Act, BLM will not review the area under Section 201 or 202 of FLPMA.

1.5.1.4 ISD RAMP 1987

The ISD was designated as a recreation area by a 1972 management plan. In 1987, an updated RAMP was adopted and included management prescriptions for the following: recreation opportunities, safety/emergency services/visitor protection, resource protection, protection of wilderness suitability, public contact and interpretation, facility development, operations and maintenance, concessions and vendors, access easements and land acquisitions, and compatibility of land uses.

The Algodones Natural Area was established north of State Route 78 (SR-78), and 5.3 miles of the Sand Dunes Road (now called Gecko Road) were constructed south of SR-78. The Cahuilla Ranger Station and Gecko campground facilities were constructed along Gecko Road. In 1977, plant studies revealed the presence of a number of sensitive species in the central dunes along the proposed Gecko Road alignment. To protect habitat for sensitive plants, BLM decided not to extend the road beyond its terminus at the site of Roadrunner Campground. The 1987 RAMP did not address federally listed species or habitat, since none were listed or designated at the time.

1.5.1.5 Interim Closures 2001

In 2000, a group of environmental organizations filed suit against the BLM alleging that BLM was in violation of Section 7 of the ESA by failing to enter into formal consultation with the USFWS on the effects of adoption of the CDCA Plan, as amended, upon threatened and endangered species.

Through a court stipulation, the BLM acknowledged that activities authorized or permitted under the CDCA Plan may adversely affect threatened and endangered species. The BLM acknowledged the requirement to consult with the USFWS to ensure that adoption and implementation of the CDCA Plan is not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of designated critical habitat of listed species. As a result of this acknowledgment, the BLM entered into a consent decree whereby it agreed to close certain portions of the Planning Area to OHV use until the Record of Decision (ROD) for the RAMP was signed. In October 2001, the BLM issued a *Federal Register* notice closing portions of the Planning Area to OHV use pursuant to 43 CFR 8341.2(a).

1.5.1.6 ISD RAMP 2003

The 1987 ISD RAMP was updated in 2003 to provide a guide for all resource management activities and to establish management actions for the Planning Area. It was designed to provide a variety of sustainable OHV and other recreational activities, and to maintain or improve the conditions of the special status species and other unique natural and cultural resources, while creating an environment to promote the health and safety of visitors, employees, and nearby residents.

The ROD for the 2003 ISD RAMP was signed in March 2005. The ROD, the RAMP, its associated Final EIS (FEIS), and supporting biological opinion (BO) were challenged in Federal District Court. In a 2006 federal court order, the FEIS, ROD, and BO as it relates to PMV were vacated and remanded to the agencies for further consideration. The court also remanded the RAMP to the BLM for further consideration. In its order, the court determined that the BLM was in violation of NEPA for its failure to consider the interim

closure alternative as a full alternative and to take a hard look at endemic invertebrate species.

The court further determined that the BLM's approval of the RAMP based on outdated invertebrate species inventory was arbitrary and capricious. The court ordered the BLM to retain the negotiated closures whose terms had expired. As a result of the court's vacatur and remand of the 2005 ROD and EIS, and the remand of the 2003 RAMP, the BLM has managed the Planning Area using a compilation of authorizations, including the approved 1987 RAMP; measures implemented pursuant to, but before, the 2003 RAMP was invalidated; and wilderness designation. By court order, the BLM has retained the interim closures.

The 2006 court order also vacated and remanded the previous USFWS critical habitat designation for the federally threatened PMV. On February 14, 2008, the USFWS published a final rule revising critical habitat for the PMV.

1.5.1.7 Northern and Eastern Colorado Desert Coordinated Management Plan

NECO is a landscape-scale, multi-agency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The NECO Plan updates the 1980 CDCA Plan to make it compatible with desert tortoise conservation and recovery.

The NECO planning area overlaps the ISD Planning Area—the eastern portion between the SRMA boundary and the Planning Area boundary (i.e., the eastern ERMA). When approved, the ISD RAMP will replace the NECO plan decisions in the overlap area.

1.5.1.8 Western Colorado Desert Routes of Travel Designations

The WECO plan amendment and EA establishes site-specific route designations based in the CDCA Plan and EIS of 1980 and is tiered to the plan and EIS (BLM 2003a).

The WECO planning area covers approximately 475,000 acres and approximately 2,320 miles of off-road vehicle routes in parts of Imperial and San Diego counties. The plan provides a balance between protecting resources and providing for OHV use by updating previous designations for off-road vehicle limited areas in Imperial County.

The WECO planning area overlaps the ISD Planning Area—the western portion between the SRMA boundary and the Planning Area boundary (i.e., the western ERMA). When approved, the ISD RAMP will maintain the WECO plan decisions in the overlap area.

1.5.1.9 Related Plans and Programmatic Records of Decision

The BLM-administered lands in the Planning Area are presently managed in accordance with the *Recreation Area Management Plan and Environmental Assessment for the Imperial Sand Dunes* (BLM 1987).

The RAMP/EIS would incorporate the following BLM programmatic RODs and environmental analyses:

- *Record of Decision for the Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS; 2007a)
- *Wind Energy Development on BLM-Administered Lands in the Western United States Final Programmatic Environmental Impact Statement* (FPEIS; 2005b)
- *Record of Decision and Resource Management Plan Amendments for Geothermal Leasing in the Western United States* (2008c)

Other related plans (BLM and non-BLM), with which the ISD RAMP will be consistent to the maximum extent possible, are:

- *South Coast Resource Management Plan and Record of Decision* (1994, currently under revision)
- California Desert Conservation Area Plan (1980), as amended
- Western Colorado Routes of Travel Designation (2003a)
- Northern and Eastern Colorado Desert Plan (2002a)

1.5.1.10 New Information

Since the 1987 RAMP was approved, many new studies and sources of information have been generated. While much of this information was incorporated into the 2003 RAMP, some of it has been generated since then. All of the information that has been generated since the approved 1987 RAMP will be incorporated in the development of alternatives and in the analysis of impacts in this EIS.

The information that has changed since the 1987 ISD RAMP was approved includes:

- **Designation of critical habitat for species protected under the ESA, specifically, designation of critical habitat for PMV, a federally threatened plant that is found in the Planning Area**. See above discussion in Section 1.3.6 related to critical habitat.

- **Changes in the social and economic conditions of Imperial County and areas adjacent to the Planning Area, as well as the entire state of California, since 1987**. These changes have led to increases in demand for use of the public lands for recreation and resource use as well as an increased awareness and social value placed on the cultural and natural resources in the Planning Area.

- **Recreation on public lands has changed dramatically over the past 25 years, both in levels of use and in the kinds of recreational activities.** Many advancements have been made in recent years in the realms of motorized vehicles that frequent the Planning Area. BLM visitor use statistics show that visitation has steadily increased in years past, but has begun to level off recently.

- **Revisions to BLM's guidance and policy related to land use planning, energy development, fire management, and other programs since the 1987 plan was approved**. For example, EO 13423 (dated January 24, 2007) encourages BLM and other federal land management agencies to make lands available for renewable energy whenever possible. In 2008, BLM published a new NEPA Handbook (H-1790-1) with updated guidance on EIS development.

- **Updated inventories of invertebrates, new cultural resource inventories, and new bird surveys**.

Both the 1987 and 2003 RAMPs were plan-level and implementation-level documents. Both plans approved management of the Planning Area on a programmatic planning and activity-specific basis. While plan-level decisions require no additional NEPA review once approval occurs, implementation-level decisions typically require additional NEPA compliance. Contrary to these earlier planning efforts, the design of this management plan is programmatic, as opposed to both programmatic and activity-specific.

1.6 Overall Vision

The vision of the ECFO in constructing this DRAMP/DEIS is to manage BLM-administered lands comprehensively to accomplish needs for all resource uses, while acting as stewards of the land and its valuable resources. The BLM will strive to provide a world class recreational experience, while aiding in the recovery of listed species. The BLM sustains the health, diversity, and productivity of the public lands for use and enjoyment of present and future generations. The ECFO has considered the public's needs and stakeholder values in the management programs of resources proposed in this DRAMP/DEIS.

THIS PAGE IS INTENTIONALLY BLANK.

CHAPTER 2.0
Description of Alternatives

2.1 Introduction

This chapter describes alternatives, including the Preferred Alternative, to address the various combinations of public land uses, recreation, and resource management practices within the Planning Area. This chapter is organized by resources and uses rather than by alternatives, so that readers may more easily compare how proposed management under each of the alternatives may affect a particular resource or resource use under BLM's administration. Following is a brief general description of each of the eight alternatives. Detailed management prescriptions are presented under the applicable program headings.

The differences between alternatives are displayed in the tables presented below and maps. Any decisions not shown in tables or maps are common to all of the alternatives.

2.2 General Description of Each Alternative

Alternative 1 (No Action) describes the management conditions prescribed in the 1987 RAMP for the Planning Area. Alternative 1 provides an opportunity to compare the 1987 RAMP prescribed management with various strategies suggested to be analyzed for future management (Alternatives 2, 3, 4, 5, 6, 7 and 8). Alternative 1 will serve as the baseline for most resources and land use allocations.

Alternative 2 describes the continuation of the present management of the Planning Area based on plan updates developed in 2003. Alternative 2 provides an opportunity to compare the current management with various strategies suggested to be analyzed for future management.

Alternative 3 generally places emphasis on preservation of the Planning Area's natural and cultural resources through limited public use. It focuses on natural processes and other unobtrusive methods for natural resource use and management. It proposes fewer motorized and developed recreation opportunities than other alternatives.

Alternative 4 provides visitors with opportunities to experience natural and cultural resource values of the Planning Area. It emphasizes a combination of natural processes and active management techniques for recreation and use management. The alternative includes management decisions that would provide a balance of multiple uses.

Alternative 4 identifies a higher level of preservation and a lower level of motorized use, recreation opportunities, and renewable development than Alternatives 5 and 6.

Alternative 5 provides visitors with opportunities to experience natural and cultural resource values of the Planning Area. It emphasizes a combination of natural processes and active management techniques for recreation and use management. The alternative includes management decisions that would provide a balance of multiple uses. Alternative 5 identifies a more moderate level of preservation and a more moderate level of motorized use, recreation opportunities, and renewable development than Alternatives 4 and 6.

Alternative 6 provides visitors with opportunities to experience natural and cultural resource values of the Planning Area. It emphasizes a combination of natural processes and active management techniques for recreation and use management. The alternative includes management decisions that would provide a balance of multiple uses. Alternative 6 identifies a lower level of preservation and a higher level of motorized use, recreation opportunities, and renewable development than Alternatives 4 and 5.

Alternative 7 generally places an emphasis on consumer-driven uses and the widest array of uses, such as renewable energy, transportation, and utility rights-of-way (ROWs), and enhanced recreational opportunities (including motorized use). It identifies areas most appropriate for these various uses. It places a greater emphasis on developed and motorized recreation opportunities and a lesser emphasis on remote settings and primitive recreation.

Alternative 8 (Preferred Alternative) provides for management of each resource and resource use by establishing a balance between authorized resource use and the protection and long-term sustainability of sensitive resources. It allows visitation and development within the Planning Area, while ensuring that resource protection is not compromised in accordance with the principles of multiple use and sustained yield as mandated by FLPMA. The proposed decisions under this alternative could be identical to those under one of the other alternatives presented or could be a combination of features from several of the other alternatives.

Throughout this chapter, information is displayed at a broad overview level which then moves to the specific. The planning document is presented first by resource, the presence or abundance of which may vary from location to location within the Planning Area. Two different types of land use plan decisions are presented for each resource under all alternatives: Goals and Objectives, and Management Actions.

- Goals and Objectives are the desired outcomes for resource conditions and resource uses.

- Management Actions are actions, allowable uses, and land designations that BLM would implement under a given alternative to achieve the goals and objectives for a particular resource or resource use.

The RAMP will address transportation and access, and will designate sections of the Planning Area as open, limited, or closed to OHV recreation. Decisions such as route designation and vending area designation are not planning-level decisions, but rather are implementation-level decisions. Individual routes will be designated as motorized, non-motorized, and unavailable.

2.3 Comparison of Alternatives

Elements of alternatives that vary are presented in table and map format. All other elements discussed are common to all alternatives, unless otherwise indicated.

2.3.1 Rangeland Health Standards Management

The BLM implements the Rangeland Health Standards and Guidelines for California and Northwestern Nevada for livestock grazing on BLM-administered lands. These standards and guidelines, approved by the Secretary of the Interior in July 2000, were prepared in consultation and coordination with the three of BLM California's four Resource Advisory Councils.

Rangeland Health Standards are to be incorporated into BLM's land use plans to improve ecological conditions. Improving ecological conditions is based upon attainment and maintenance of the fundamentals for healthy ecological systems. Standards are defined as an expression of the level of physical and biological condition or degree of function required for healthy, sustainable rangelands.

2.3.1.1 Goals and Objectives

- Meet or exceed the national policy for watersheds, ecological processes, water quality, and habitats.

- Implement standards as directed by national policy, as well as regional standards found in NECO and WECO plans.

2.3.1.2 Management Actions by Alternative

2.3.1.2.1 Alternative 1–No Action

Under Alternative 1, ECFO will continue to utilize existing national fallback standards for grazing allotments. Fallback standards were developed to implement 43 CFR 4180 grazing regulations. The fallback standards for rangeland health are:

1. Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, and landform.

2. Riparian–wetland areas are in proper functioning condition.

3. Stream-channel morphology (including but not limited to gradient, width/depth ratio, channel roughness, and sinuosity) and functions are appropriate for the climate and landform.

4. Healthy, productive, and diverse populations of native species exist and are maintained.

2.3.1.2.2 Alternatives 2 through 8

Adopt the following regional standards for rangeland health. The proposed standards of rangeland health are:

Standard #1—Soils: Soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, geology, landform, and past uses. Adequate infiltration and permeability of soils allow accumulation of soil moisture necessary for optimal plant growth and vigor, and provide a stable watershed, as indicated by:

- Canopy and ground cover are appropriate for the site;

- There is diversity of plant species with a variety of root depths;

- Litter and soil organic matter are present at suitable sites;

- Microbiotic soil crusts are maintained and in place;

- Evidence of wind or water erosion does not exceed natural rates for the site; and

- Soil permeability, nutrient cycling, and water infiltration are appropriate for the soil type.

Standard #2—Riparian-Wetland and Stream Function: Wetland systems associated with subsurface, running, and standing water function properly and have the

ability to recover from major disturbances. Hydrologic conditions are maintained as indicated by:

- Vegetative cover adequately protects banks and dissipates energy during peak water flows;
- Dominant vegetation is an appropriate mixture of vigorous riparian species;
- Recruitment of preferred species is adequate to sustain the plant community;
- Stable soils store and release water slowly;
- Plant species present indicate that soil moisture characteristics are being maintained;
- There is minimal cover of shallow-rooted invader species and they are not displacing deep-rooted native species;
- Shading of stream courses and water sources is sufficient to support riparian vertebrates and invertebrates;
- Stream is in balance with water and sediment is being supplied by the watershed where appropriate;
- Stream channel size and meander is appropriate for soils, geology, and landscape; and;
- Adequate organic matter (litter and standing dead plant material) is present to protect the site and to replenish soil nutrients through decomposition.

Standard #3—Native Species: Healthy, productive, and diverse habitats for native species, including special status species, are maintained in places of natural occurrences, as indicated by:

- Photosynthetic and ecological processes continue at levels suitable for the site, season, and precipitation regimes;
- Plant vigor nutrient cycles and energy flows are maintaining desirable plants and ensuring reproduction and recruitment;
- Plant communities are producing litter within acceptable limits;
- Age class distributions of plants and animals are sufficient to overcome mortality fluctuations;

- Distribution and cover of plant species and their habitats allow for reproduction and recovery from localized catastrophic events;
- Alien and noxious plants and wildlife do not exceed acceptable levels or require action to prevent the spread and introduction of noxious/invasive weeds;
- Appropriate natural disturbances are evident; and
- Populations and their habitats are sufficiently distributed to prevent the need for new listings of special status species.

Standard #4—Water Quality: Water quality would meet state and federal standards, including exemptions allowable by law, as indicated by:

- Dissolved oxygen levels, aquatic organisms, and aquatic plants (e.g., macroinvertebrates, fish, and algae) indicate support of beneficial uses;
- Chemical constituents, water temperatures, nutrient loads, fecal coliform, and turbidity are appropriate for the site or source; and
- Best management practices (BMP) would be implemented (BMP have been included in Appendix C of this document).

2.3.2 Air Resources Management

The FLPMA and the Clean Air Act (CAA) of 1970 and Amendments of 1977 and 1990 (42 USC 7401 et seq.) prohibit BLM or any federal land management agency from conducting, supporting, approving, licensing, or permitting any activity on federal land that does not comply with all applicable local, state, and federal air quality laws, statutes, regulations, and implementation plans. In support of these regulations, a program has been developed that provides benefits to air quality and other resources by decreasing air pollutant concentrations, increasing visibility, and decreasing atmospheric deposition. Adherence to air quality regulatory programs through coordination with other federal and state agencies is a key to air quality management success.

Other applicable regulations include:

- Applicable National Ambient Air Quality Standards (NAAQS; Section 109)
- State Implementation Plans (SIPs; Section 110)
- Control of Pollution from Federal Facilities (Section 118)
- Prevention of Significant Deterioration, including visibility impacts to mandatory Federal Class I Areas (Section 160 et seq.)

- Conformity Analyses and Determinations (Section 176(c))

2.3.2.1 Goals and Objectives

- Maintain or improve air quality as established by the NAAQS and California Ambient Air Quality Standards (CAAQS) through cooperative management of emissions with industry, the State of California, and federal agencies.

- BLM would strive to minimize, within the scope of its authority, any emissions that may cause violations of air quality standards, add to acid rain, or degrade visibility.

2.3.2.2 Management Actions Common to All Alternatives

- Comply with the State of California for all proposed actions that would contribute to particulate matter emissions in the air as a result of actions taken.

- As needed, based on the Dust Control Plan (once approved by Imperial County Air Pollution Control District [ICAPCD]), treat the following access roads for dust control to reduce the impact of OHV activities on air quality, as personnel and funding levels allow: Wash Road adjacent to the Union Pacific Railroad (UPRR; from south of Glamis to the Clyde Overcrossing) and the entry road to Dunebuggy Flats Campground.

- Install air meters for ozone and particulate matter less than 10 microns in diameter (PM_{10}) in the Planning Area, if requested by ICAPCD or the Environmental Protection Agency (EPA). Implement actions to mitigate for contributions to the non-attainment due to activities in the Planning Area, as requested by ICAPCD, and as personnel and funding levels allow.

- Evaluate impacts of activities within the Planning Area to air quality non-attainment. Implement BLM dust control plan to improve air quality as required by the ICAPCD.

2.3.3 Soil Resource Management

The ISD comprise a variety of dune types (e.g., draas, linear, parabolic, barchan, zibars). These dunes are separated occasionally by inter-dune areas, where relatively little sand accumulates into dune formations. The dune system lies on alluvial fan material emanating from the Cargo Muchacho and Chocolate mountains. Some dunes reach 300 feet in height.

The Planning Area contains a wide variety of soil types, as might be expected in a zone which spans the transition from low desert to rocky desert mountains. This variety of soil types is the result of diversity in parent material, relief, climate, living organisms, and age of the soils.

2.3.3.1 Goals and Objectives

- Manage soils to maintain productivity and to minimize erosion.
- Preserve natural process of dune movement and formation.
- Meet proposed Rangeland Health Standard #1, as related to soils per the regional standards of rangeland health (see Section 2.3.1.2).

2.3.3.2 Management Actions Common to All Alternatives

- Minimize surface disturbance from authorized activities. Post-activity, disturbed surfaces would be restored to a pre-disturbance or natural condition as applicable.
- Incorporate erosion control measures into projects on a case-by-case basis.
- Manage vegetation to minimize erosion and maintain natural dune structure.

2.3.4 Water Resources Management

The objective of the Federal Water Pollution Control Act (Clean Water Act [CWA] PL 92-500, as amended; 33 USC §§ 1251 et seq.) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters (Section 101a). Under Sections 401 and 404, the CWA regulates point and non-point-source pollution. Other applicable regulations include the California Water Code.

Surface waters in the Planning Area can be divided into watersheds, portions of the landscape that collect runoff from the surface, concentrate it into channels, and conduct the resulting flow to a definable outlet. The Planning Area is traversed by the All-American and the Coachella canals, which carry water from the Colorado River to the Imperial and Coachella valleys. The Planning Area is within the Colorado River watershed basin (Region 7).

The Planning Area occurs within the Amos–Ogilby–East Mesa groundwater basin. BLM has no direct authority over the groundwater. Rather, the groundwater resource is managed by the California State Water Resources Control Board (SWRCB) and California Department of Water Resources (DWR). BLM works in cooperation with SWRCB and DWR.

2.3.4.1 Goals and Objectives

2.3.4.1.1 General

- Ensure that BLM activities or authorized activities do not degrade surface or groundwater in the Planning Area.
- Ensure that water quality achieves or is making significant progress toward achieving established BLM management objectives such as meeting wildlife needs.
- Meet proposed Rangeland Health Standard #4, as related to water quality per the regional standards of rangeland health (see Section 2.3.1.2).

2.3.4.1.2 Surface Water

- Identify and protect surface waters where possible.
- Preserve and enhance the natural condition and hydrology of washes.
- Identify area wide use restrictions or other protective measures to meet federal, state, and local water quality requirements.

2.3.4.1.3 Groundwater

Make groundwater, where present, available for beneficial use on public lands in coordination with Imperial County.

2.3.4.2 Management Actions Common to All Alternatives

- Prevent or reduce water quality degradation through implementation of applicable BMP or other specific mitigation measures, when applicable (BMP have been included in Appendix C of this document).
- Continue to maintain or improve water quality in accordance with state and federal standards. Consult with the appropriate state agencies on proposed projects that may significantly affect water quality.
- Maintain authorized vehicle routes in a manner that will promote natural hydrology and protect water quality through application of BMP (BMP have been included in Appendix C of this document).

2.3.5 Vegetative Resource Management

The primary vegetation communities within the Planning area are: creosote bush scrub, microphyll woodlands, psammophytic scrub, and canal-influenced vegetation (Westec 1977; BLM 1987).

The basis for managing vegetation and invasive or noxious weeds for BLM lands can be found in the following federal laws, regulations, and policies:

- Taylor Grazing Act of 1934
- Public Rangelands Improvement Act of 1978
- CWA of 1977
- Federal Noxious Weed Act of 1974
- EO 13112—*Invasive Species Control*
- BLM Manual Section 1740—*Renewable Resource Improvements and Treatments*
- BLM Manual 9011—*Chemical Pest Control*
- *Vegetation Treatment Using Herbicides on BLM Lands in* 17 *Western States Final Programmatic Environmental Impact Statement* and ROD of November 2007
- Endangered Species Act of 1973, as amended
- Natural Resources Conservation Service (NRCS) Ecological Site Guides
- California State Director and Pacific Southwest Regional Forester Traditional Gathering Policy

In addition, the following non-federal agreements and laws apply to the Planning Area:

- California Native Plant Protection Act of 1977
- California Endangered Species Act
- 1988 Food and Agricultural Code of California (Division 23, California Desert Native Plants Acts)

2.3.5.1 Plant Communities

2.3.5.1.1 Goals and Objectives

Planning Area-wide

- Maintain viable populations of all native species throughout the Planning Area.
- Maintain habitat connectivity throughout the Planning Area to limit habitat fragmentation and maintain transfer of genetic material from all sub-populations.
- Protect biological diversity through conservation of native plant communities and special status species with consideration for multiple uses of the land and sustained ecological function.
- Maintain and enhance a mosaic of native plant communities.
- Promote wildlife forage and habitat values, and maintain and/or restore intrinsic biological integrity and value of all native plant communities.
- Protect or restore native species through an integrated weed management approach emphasizing prevention, early detection, and eradication of invasive non-native plants.
- Ensure that plant communities continue to support wildlife in a manner consistent with other resource management practices or uses.
- Promote natural processes that secure soil resources and protect against erosion and air quality degradation.
- Meet proposed Rangeland Health Standards #3 and #4, as related to vegetative resources per the regional standards of rangeland health (see Section 2.3.1.2).

Desired Plant Communities

Creosote Bush Scrub

- Promote multi-layered desert communities that are dominated by perennial vegetation, which provide for watershed connectivity, sediment capture and storage, energy dissipation, and bank stability.
- Promote diverse vegetative composition and structure that include such species as creosote (*Larrea tridentata*), desert willow (*Chilopsis linearis* spp. *arcuata*), Mormon tea (*Ephedra trifurca*), burro bush (*Ambrosia dumosa*) and giant Spanish needle (*Palafoxia arida* var. *gigantea*).

- Ensure sufficient vegetation that provides landscape habitat connectivity and physical stability, which in turn support ground-dwelling species.

Microphyll Woodlands

- Promote multi-layered desert communities that are dominated by perennial vegetation, which provide for watershed connectivity, sediment capture and storage, energy dissipation, and bank stability.

- Promote diverse vegetative composition and structure that include such species as blue palo verde (*Cercidium floridum* spp. *floridum)*, desert willow, ironwood (*Olneya tesota*), mesquite (*Prosopis glandulosa* var. *torreyana)*, smoke tree (*Psorothamnus spinosus)*, and catclaw acacia (*Acacia greggii*). Size and growth form, such as overhanging branches and mid- and under-story vegetation, are represented by naturally occurring species of moderate density.

- Ensure sufficient vegetation that provides landscape habitat connectivity and physical stability, which in turn support ground-dwelling species.

Psammophytic Scrub

- Promote diverse vegetative composition and structure that include such species as Colorado desert buckwheat (*Eriogonum deserticola*), Mormon tea, fan-leaf crinkle-mat (*Tequilia plicata*), and Wiggin's croton (*Croton wigginsii*).

- Ensure sufficient vegetation that provides landscape habitat connectivity and physical stability, which in turn support ground-dwelling species.

2.3.5.1.2 Management Actions Common to All Alternatives

- Implement a monitoring plan for the microphyll woodland community. Analyze the monitoring data to compare the trend in vegetation cover due to the different types of impacts in each area.

- Implement a thorough monitoring program to track recreation use and the condition of special status species (Appendix E).

- Avoid adverse impacts to special status species, priority species, plants protected by the California Native Plant Protection Act, and their associated habitats by developing, modifying, redesigning, mitigating, or abandoning specific projects.

- Restore degraded native plant communities through restoration activities that could include but are not limited to exclusion of disturbance activity, invasive plant removal, site preparation, and revegetation.

- Restore surface disturbance from discretionary activities (e.g., ROW construction) with rehabilitation measures including imprinting, contouring, debris and brush replacement, native plant seeding (where appropriate), and invasive plant treatment.
- Restore surface disturbance from illegal trespass activities (not including closure violations) with rehabilitation measures including imprinting, contouring, debris and brush replacement, native planting or seeding (where appropriate), and invasive plant treatment.
- Require minimum impact approaches such as trimming trees instead of removal, using existing routes and ROWs instead of creating new ones, and using previously disturbed sites and crushed vegetation instead of blading new routes, where appropriate.
- Encourage transplanting of plant species directly on-site or onto neighboring public lands where feasible, using approved protocol for surface-disturbing activities where avoidance is not possible.
- Design surface-disturbing activities to avoid impacts to desired plant communities to the greatest extent possible. Where avoidance is not possible, these areas would be restored to their previously undisturbed or native condition. Restoration would follow approved protocol and include watering and maintenance until establishment.
- Remove tamarisk (*Tamarix* spp.) and other non-native invasive plant species using mechanical and herbicide applications in accordance with BLM policy on minimum tools in wilderness and the Vegetation Treatment Using Herbicides on BLM Lands in 17 Western States FPEIS (BLM 2007a) and ROD of November 2007.
- Salvage useable native plants and parts of plants where plants would normally be lost due to development, disposal, or disturbance on public lands when practicable. Plants and parts of plants may be replanted on public lands or salvaged for public purposes. Plants and parts of plants would only be removed from public lands pursuant to applicable federal and state laws and regulations governing the sale, disposal, and transportation of plants.
- Use native plant materials for landscaping at developed facilities within public lands.
- Treat non-native invasive species, where appropriate, to meet management objectives.
- Limit the introduction of non-native plants through an education program partnered with recreational users, OHV users, and other recreational users.

- Develop partnerships with adjacent landowners, local agencies, state agencies, and federal agencies to manage habitat, conduct restoration activities, develop educational material, and provide interpretation of vegetation.
- Give rehabilitation priority to habitat that supports special status species and ACECs.
- Encourage enforcement of existing administrative vehicle closures.

2.3.5.1.3 Management Actions by Alternative

Table 2-1 presents the management actions that vary by alternative.

TABLE 2-1
MANAGEMENT ACTIONS FOR VEGETATION RESOURCES BY ALTERNATIVE

Management Actions	1	2	3	4	5	6	7	8
Prohibit removal of native standing trees, alive or dead, with the exception of fire management, public health and safety, or disease control.		X	X	X	X	X	X	X
Classify microphyll woodlands as avoidance areas[1] for all commercial and non-commercial surface-disturbing activities.				X	X	X		X
Classify microphyll woodlands as exclusion areas[1] for all commercial and non-commercial surface-disturbing activities.			X					
Exclude microphyll woodlands south of Wash 20 from OHV recreation.			X	X	X			
Open a portion of microphyll woodlands south of Wash 20 to OHV recreation.	X	X				X	X	
Allow OHV recreation and prohibit camping in microphyll woodlands south of Wash 25 and north of Wash 69.								X

[1] Avoidance area is defined as an area only available for discretionary land-use authorizations when there are no other reasonable alternatives for the authorization. Exclusion area is defined as an area that is not available for discretionary land-use authorizations.

2.3.5.2 Priority Plant Species

Priority plant species are rare, unusual, or key species that are not listed as BLM sensitive or listed as threatened and endangered species. Priority plant species are known from or near the BLM-administered lands within the Planning Area. The priority plant species list would be updated on a regular basis to reflect new information and survey data. These species have ecological importance, rarity, and human interest. Identification of priority plant species would help prevent the avoidable loss of these plants due to development and implementation of other multiple-use objectives.

2.3.5.2.1 Goals and Objectives

- Ensure that plant species populations are stable or increasing, with adequate recruitment given the ecological conditions and dynamics associated with the Planning Area.

- Promote landscape-scale conservation of the priority plant species to protect or restore botanical resources of concern and to ensure consistent management across jurisdictional boundaries.

2.3.5.2.2 Management Actions Common to All Alternatives

- Implement a monitoring plan for sand food (*Pholisma sonorae*), a priority plant species.

- Minimize or mitigate loss of habitat or fragmentation of priority plant species populations.

- Avoid priority plant species where possible to mitigate for surface-disturbing activities. Where avoidance is not possible, these populations would be restored to their previously undisturbed or native condition after completion of the activity. Restoration would follow approved protocol and include watering and maintenance until establishment.

- Implement protection and restoration measures such as signage, invasive weeds treatment, and native plants seed collection for the priority plant species.

- Treat non-native invasive species where appropriate to protect priority plant species.

2.3.5.3 Invasive Non-native Plants

Non-native, invasive, and state- and federally listed noxious weed species collectively constitute one of the gravest threats to the biodiversity of BLM lands. Two critical components of managing these species are (1) identifying those species that threaten biodiversity and other ecological functions and values and (2) prioritizing species for management efforts, which must be based, at least in part, on the ecological impacts imparted by these invaders.

Non-native invasive species degrade aesthetic vegetation values, tourism opportunities, and recreational value of public lands. Native species in upland and riparian ecosystems are competitively reduced, and the ecological process altered when non-native plants (both noxious and invasive weeds) become established and flourish.

2.3.5.3.1 Goals and Objectives

Prevent the introduction or spread of non-native invasive and state- and federally listed noxious weed species and promote the reduction of existing invasive species populations.

2.3.5.3.2 Management Actions Common to All Alternatives

- Use an integrated pest management (IPM) approach to ensure that the best methods available are implemented to prevent the introduction of and to control the spread of non-native plants, invasive plants, and noxious weeds (DOI 2007).
- Treat non-native invasive species that constitute significant fuel load and fire threat directly by using IPM or management through fire breaks and other tactics.
- Treat tamarisk and other invasive, non-native species in the Planning Area.

2.3.5.4 Vegetative Use Authorization

BLM manages vegetation for habitat, multiple use, and sustained yield. This section describes what authorizations are needed to collect plant material from public land and what activities do not require written authorization.

2.3.5.4.1 Goals and Objectives

- Ensure presence of dead and downed wood on the ground to provide wildlife habitat and reduce soil erosion.
- Allow for the collection of plant material consistent with the maintenance of natural ecosystem processes.

2.3.5.4.2 Management Actions Common to All Alternatives

- Prohibit wood cutting for commercial purposes in the Planning Area.
- Prohibit dead and downed wood collection within ACECs.
- Prohibit commercial wood collection within the microphyll woodlands or ACECs.
- Grant free use, without permit, of culturally important plants for traditional cultural gathering of vegetation by Native Americans in accordance with Interagency Traditional Gathering Policy. No commercial vegetation collection would be permitted. All other collection would be permitted on a case-by-case basis.

2.3.5.4.3 Management Actions by Alternative

The following management actions for vegetative use authorizations presented in Table 2-2 vary by alternative.

TABLE 2-2
MANAGEMENT ACTIONS FOR VEGETATIVE USE AUTHORIZATION BY ALTERNATIVE

Management Actions	1	2	3	4	5	6	7	8
Prohibit removal of native standing trees alive or dead with the exception of fire management, public health and safety, or disease control.		X	X	X	X	X	X	X
Allow collection of dead and downed wood in the microphyll woodlands.		X		X	X	X	X	
Prohibit collection of dead and downed wood within the ISD SRMA.			X					X

Allowable Uses Requiring Permits

To manage vegetation resources, the BLM would administer a permit program for specific commercial and non-commercial uses. Vegetative use authorization would be considered on a case-by-case basis and permits would include standard guidelines and stipulations for collection. Permits could also include stipulation developed during a site-specific NEPA analysis. Priority plant species would be protected and collections would be permitted on a case-by-case basis.

- **Plant and Seed Collection.** Scientific collection of vegetative materials, including seeds, would require a free-use permit (Form 5510). Commercial seed collection would require a permit on BLM lands and would follow approved protocol. Seed collection for BLM administrative use would follow approved protocol.

- **Salvage Plant Collection.** Plant salvage would be allowed within the Planning Area on a case-by-case basis. Plant salvage would require prior written authorization from BLM as well as a permit from the US Department of Agriculture (USDA) as required by the California Native Plant Protection Act.

Allowable Uses Not Requiring Permits

The public does not need a written authorization or permit for the following uses:

- Per 43 CFR 8365.1-5(b), reasonable amounts (as defined below) of the following may be collected from the public lands for non-commercial purposes:
  1. Small quantities (no more than 20 percent of available resource from any individual plant and from total collecting area) of flowers for personal use;

2. Small quantities (no more than 20 percent of available resource from any individual plant and from total collecting area) of dry vegetation, nuts, or berries;
3. Five or fewer pieces (i.e., cuttings) of a live native plant (California Native Plant Protection Act)—no whole plants may be collected;
4. Tamarisk in any quantities.

- Free use, without permit, of culturally important plants may be granted for traditional cultural gathering of vegetation by Native Americans, in accordance with the California State Director and Pacific Southwest Regional Forester Traditional Gathering Policy.
- Collection of dead and downed wood from microphyll woodlands or ACECs

Prohibited Uses (Collection Not Allowed)

The public is prohibited from collecting:

- Live cacti of any kind;
- Whole, live native plants;
- Fuel wood for home heating purposes; and
- All species in the family Fouquieriaceae (e.g., ocotillo, candlewood); the genus *Prosopis* (mesquites); the genus *Cercidium* (palo verdes); *Acacia greggii* (catclaw acacia); *Dalea spinosa* (smoketree); and *Olneya testota* (ironwood), including both dead and live specimens.
- Any species listed as a special status species in Chapter 3, Section 3.7.
- The collection and possession of ironwood at any time would be prohibited.

2.3.6 Wildlife Resource Management

The Sikes Act of 1974 authorized the DOI in cooperation with state agencies responsible for the administration of fish and wildlife laws to plan, develop, maintain, and coordinate programs for the conservation and rehabilitation of fish and wildlife (both game and non-game) on public lands within its jurisdiction. In addition to the Sikes Act, the following laws, regulations, and policies direct the management of fish and wildlife on BLM-administered public lands:

- Migratory Bird Treaty Act of 1918
- Fish and Wildlife Coordination Act of 1958

- Fish and Wildlife Conservation Act of 1980
- EO 13112—*Invasive Species*
- EO 13186—*Conservation of Migratory Birds*
- EO 13443—*Enhancement of Hunting Opportunities*
- BLM Manual 6500—*Wildlife, Fish, and Plant Resources*
- BLM Manual 6740—*Wetland–Riparian Area Protection and Management*

The BLM works cooperatively with CDFG. Under California laws, the CDFG is responsible for the preservation and management of fish and wildlife found within the state of California. The BLM is likewise responsible for the management of fish and wildlife habitat on BLM-administered lands. BLM assists CDFG by providing the appropriate agreements or permits for conducting wildlife management activities on BLM lands, as well as assist with the collection and sharing of data. BLM law enforcement patrols and enforces game violations on BLM-administered lands.

In addition to the goals and objectives, and management actions presented in this section, Vegetative Resource Management and Lands and Realty Management (Sections 2.3.5 and 2.3.16, respectively) also contain goals and objectives and management actions that provide additional wildlife habitat conservation measures.

2.3.6.1 Planning Area-wide

2.3.6.1.1 Goals and Objectives

- Maintain viable populations of all native species throughout the Planning Area.
- Maintain habitat connectivity throughout the Planning Area to limit habitat fragmentation and maintain transfer of genetic material from all sub-populations throughout the Planning Area.
- Promote and maintain healthy key habitats (e.g., microphyll woodlands and psammophytic scrub) and associated wildlife assemblages.
- Promote wildlife resources that would meet conservation, socio-economic (e.g., hunting, watchable wildlife), and tribal needs.
- Provide well-distributed habitat and connectivity corridors capable of supporting self-sustaining populations of interacting groups of priority species for biodiversity and genetic viability.

- Provide suitable habitat capable of maintaining stable or increasing trends in abundance of wildlife species.

- Reduce human-caused disturbance to habitats that result in animal mortalities or undesirable effects to populations of priority species during critical times, such as breeding or drought.

- Maintain or restore appropriate amount, distribution, and characteristics of life-stage habitats for general wildlife species. Populations of non-native plants should be reduced or eradicated in areas where their presence threatens the integrity of general wildlife populations.

2.3.6.1.2 Management Actions Common to All Alternatives

- Restore native species habitat distribution and occurrence (especially for priority species), conserve biological diversity, maintain genetic integrity and exchange, and improve availability of suitable habitats and habitat linkages. Initiate restoration activities in priority habitats, such as invasive weed removal or native seeding, to move toward desired habitat conditions and provide functional landscapes to sustain populations of fish and wildlife species. Wildlife habitat improvement projects for the Planning Area would be implemented in coordination with CDFG, pursuant to Section 103(f) of the CDPA of 1994 as necessary.

- Authorize reintroductions, transplants, and supplemental stockings (augmentations) of native wildlife populations (as defined in BLM Manual 1745) in current or historic ranges in cooperation with CDFG and/or the USFWS to (1) maintain populations, distributions, and genetic diversity, (2) conserve or recover threatened or endangered species, (3) restore or enhance native wildlife diversity and distribution; and (4) maintain isolated populations.

- Manage invasive and pest species in accordance with applicable BLM or CDFG management policies depending on administrative area.

- Coordinate with CDFG to ensure that wildlife guzzlers provide safe access to usable water.

- Pursue land acquisition options (i.e., purchase, exchange, donation, and easement) to consolidate important wildlife habitats.

- Maintain habitat connectivity throughout the Planning Area.

- Maintain current wildlife guzzlers through cooperation with CDFG and volunteer contributions.

2.3.6.1.3 Management Actions by Alternative

The following management actions presented in Table 2-3 vary by alternative.

TABLE 2-3
MANAGEMENT ACTIONS FOR WILDLIFE RESOURCES BY ALTERNATIVE

Management Actions	1	2	3	4	5	6	7	8
Maintain current wildlife guzzlers through CDFG and volunteer contributions. Consider construction of new wildlife guzzlers on a case-by-case basis, in coordination with CDFG.		X		X	X	X	X	X
Maintain current wildlife guzzlers through CDFG and volunteer contributions. No construction of new wildlife waters.			X					

Note: See Vegetative Resource Management and Lands and Realty Management (Sections 2.3.5 and 2.3.16, respectively) for additional habitat conservation actions that would affect wildlife resources.

2.3.6.2 Priority Wildlife Species

Proposed priority species for the Planning Area include raptors, non-game migratory birds, bats, invertebrates, and game animals.

2.3.6.2.1 Raptors

Goals and Objectives

- Maintain, restore, or enhance nesting and foraging habitat for raptors.
- Provide for safe passage of migrating raptors.

Management Actions Common to All Alternatives

- Provide natural or man-made nesting or perching structures in suitable areas to enhance foraging and breeding habitat for raptors as the need arises.
- Require all new structures to be raptor-safe in accordance with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee 2006) or the current version of this document.
- Apply the BLM wind energy development program policies and BMP relating to raptors from Appendix A in the Wind Energy Development Program ROD (BLM 2005c).

2.3.6.2.2 Non-game Migratory Birds

Goals and Objectives

- Maintain, restore, or enhance nesting, foraging, and migratory stopover habitat consistent with non-game migratory bird habitat management objectives, emphasizing the natural biological diversity.
- Provide for safe passage of non-game migratory birds.
- Minimize habitat fragmentation and provide for migratory corridors.
- Promote socio-economic and recreational values of birds, such as ecotourism.

Management Actions Common to All Alternatives

- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable, through the application of mitigation measures on authorized activities.
- Management actions would be guided by recommendations of comprehensive migratory bird planning efforts such as those completed by California Partners in Flight, including the *Riparian Bird Conservation Plan* (Riparian Habitat Joint Venture 2004), and other plans as available.
- Require all new structures to be bird-safe in accordance with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee 2006) or the current version of this document.
- Apply the BLM wind energy development program policies and BMP relating to non-migratory game birds from Appendix A in the Wind Energy Development Program ROD (BLM 2005c).
- Provide recreational opportunities for bird watching and photography.
- Monitor new energy development, including power lines and wind turbines or other structures, to better understand risks to non-game migratory birds.
- Require a non-game migratory bird inventory for new utility or energy projects.

2.3.6.2.3 Bats

Goals and Objectives

Maintain, enhance, and protect bat roost sites and foraging habitat while providing for public safety.

Management Actions Common to All Alternatives

- Protect foraging habitat within microphyll woodlands.
- Apply the BLM wind energy development program policies and BMP from Appendix A in the Wind Energy Development Program ROD (BLM 2005c).
- Require a bat inventory for new wind energy projects.

2.3.6.2.4 Invertebrates

Goals and Objectives

- Promote adequate vegetative structure including nectar sources, foraging, and breeding substrate for invertebrate species.
- Protect public health and safety from Africanized bees.
- Promote native pollinator species.
- Protect habitat requirements for insect species of concern found within the Planning Area.
- Maintain and enhance habitat across a wide variety of dune environments.

Management Actions Common to All Alternatives

- Avoid adverse impacts to sensitive invertebrate species and associated habitats by developing, modifying, redesigning, mitigating, or abandoning specific projects.
- Restore surface disturbance from discretionary activities, such as ROW construction, with rehabilitation measures including imprinting, contouring, debris and brush replacement, native plant seeding (where appropriate), and invasive plant treatment.
- Restore surface disturbance from illegal trespass activities (not including closure violations) with rehabilitation measures including imprinting, contouring, debris and brush replacement, native planting or seeding (where appropriate), and invasive plant treatment.

2.3.6.2.5 Game Animals (Birds and Mammals)

Resident small game animals are those defined in the Title 14 California Code of Regulations Section 257: Chinese spotted doves, ringed turtledoves of the family Columbidae, California quail and varieties thereof, Gambel or desert quail, mountain quail and varieties thereof, blue grouse and varieties thereof, ruffed grouse, sage grouse (sage hens), white-tailed ptarmigan, Hungarian partridges, red-legged partridges,

including the chukar and other varieties, ring-necked pheasants and varieties, and wild turkeys of the order Galliformes; and the following game mammals: jackrabbits and varying hares (genus *Lepus*), cottontail rabbits, brush rabbits, pygmy rabbits (genus *Sylvilagus*), and tree squirrels (genus *Sciurus* and *Tamiasciurus*).

Resident big game animals are those defined in the Title 14 California Code of Regulations Section 350: deer (genus *Odocoileus*), elk (genus *Cervus*), pronghorn antelope (genus *Antilocarpa*), wild pig (feral pigs, European wild pigs and their hybrids [genus *Sus*]), black bear (genus *Ursus*) and Nelson bighorn sheep (subspecies *Ovis canadensis nelsoni*) in the areas described in the Fish and Game Code subsection 4902(b).

Goals and Objectives

- Maintain, enhance, and protect habitat for native game animal populations.
- Promote the legal pursuit of game.

Management Actions Common to All Alternatives

- Prohibit OHV use for the pursuit of game within closed areas.
- Maintain, restore, or enhance water resources for native game animal populations. Water developments would include design features to ensure safety and accessibility to water by desirable wildlife. Where practical, water troughs and tanks would be kept full year-round to provide a continuous water supply for native game animals. Provide reasonable administrative use-related vehicular access by CDFG personnel to game animal water facilities for operation and maintenance activities, which could include cross-country travel along a pre-approved route. Enhancement projects would not be undertaken for non-native birds and mammals.
- Apply the BLM wind energy development program policies and BMP from Appendix A in the Wind Energy Development Program ROD (2005c).

Management Actions by Alternative

Construction of new wildlife guzzlers would be authorized on a case-by-case basis under Alternatives 2, 4, 5, 6, 7, and 8 (see Table 2-3). In Alternative 3, there would be no construction of new wildlife guzzlers.

2.3.7 Special Status Species Management

Special status species are fish, wildlife, and plants that require specific conservation measures or management directions due to population or habitat concerns. Special management measures within BLM-administered lands are necessary to reduce or

eliminate potential adverse impacts to species or habitats, particularly measures to reduce the likelihood of take of a listed species under the ESA. Special status species fall under the following broad categories: (1) federally listed species: threatened, endangered, proposed, or candidate species and designated or proposed critical habitat; (2) state-listed species; and (3) BLM sensitive species.

The BLM shall carry out management for the conservation of state-listed plants and animals. State laws protecting these species apply to all BLM programs and actions to the extent that they are consistent with FLPMA (43 USC 1701 et seq.) and other federal laws.

The protection provided by the BLM's policy for candidate species (Manual 6840) is the minimum level of protection for BLM sensitive species.

Land use plan decisions would be consistent with BLM's mandate to protect and recover species listed under the ESA and would be consistent with objectives and recommended actions in approved recovery plans.

In addition to the ESA, the following laws, regulations, and policies direct the management of special status species on BLM-administered public lands:

- Migratory Bird Treaty Act of 1918, as amended
- Bald Eagle Protection of 1940, as amended 1962
- Fish and Wildlife Coordination Act of 1958
- Sikes Act of 1974
- California Native Plant Protection Act of 1977
- California ESA of 1984
- EO 13186—*Conservation of Migratory Birds*
- DOI Manual 520—*Riparian Habitat*
- BLM Manual 6500—*Wildlife, Fish, and Plant Resources*
- BLM Manual 6840—*Special Status Species Management*
- BLM California Manual H-6840.06—*Special Status Plant Management*
- BLM Manual 1737—*Riparian-Wetland Area Management*
- Approved Recovery Plans for federally listed species

2.3.7.1 Planning Area-wide

2.3.7.1.1 Goals and Objectives

- Maintain, enhance, and restore habitats for the survival and recovery of species listed under the ESA and to prevent proposed or candidate species from becoming listed as endangered or threatened under the ESA. Perform management actions that contribute to recovery and delisting of species listed under the ESA.

- Avoid or minimize activities that would result in the following situations for special status species and associated habitat on BLM-administered public lands: (1) species becoming endangered or extirpated from public lands in the Planning Area; (2) species undergoing significant current or predicted downward trend in habitat capability that would reduce a species' existing distribution; and (3) species undergoing significant current or predicted downward trend in population or density.

- Provide habitat capable of maintaining stable or increasing population trends of special status species to ensure persistence. Provide suitable ecological conditions that constitute well-distributed habitats and connective corridors to support reproductive needs and free-flow movements of special status species for population persistence.

- Manage allowable uses to minimize habitat destruction, degradation, and fragmentation to protect special status species. Habitat modifications from land and resource uses would be at levels that do not threaten the persistence of special status species populations.

- Achieve stable or increasing populations of special status plant species over time with adequate pollination, nurse plants, recruitment, and survivorship. Maintain desired habitat conditions or restore degraded habitats to promote pollinator success and survival.

- Achieve stable or increasing populations of special status animal species over time with adequate recruitment and survivorship. Maintain desired habitat conditions or restore degraded habitats to promote reproductive success and survival.

- Protect the habitat of sensitive species throughout the Planning Area.

2.3.7.1.2 Management Actions Common to All Alternatives

- Utilize existing laws to protect special status species, as needed (according to 43 CFR 8341.2).

- Implement species- or habitat-specific goals, objectives, and actions, as applicable, addressed in the approved recovery plans.

- Prohibit activities or projects on BLM-administered lands that would jeopardize the continued existence of federally listed plant and wildlife species, or species proposed for listing.
- Authorize reintroductions, transplants, and supplemental stockings (augmentations) of special status species populations (as defined in BLM Manual 1745) in current or historic ranges in cooperation with CDFG and/or the USFWS to (1) maintain populations, distributions, and genetic diversity, (2) conserve or recover threatened or endangered species, (3) restore or enhance diversity and distribution; and (4) maintain isolated populations.
- Maintain or restore appropriate amount, distribution, and characteristics of life-stage habitats for special status plant species. Populations of non-native plants should be reduced or eradicated in occupied and potential special status plant habitat.
- Apply the BLM wind energy development program policies and BMP from Appendix A in the Wind Energy Development Program ROD (BLM 2005c).

2.3.7.1.3 Management Actions by Alternative

Table 2-4 presents the management actions for special status species that vary by alternative.

TABLE 2-4
MANAGEMENT ACTIONS FOR SPECIAL STATUS SPECIES BY ALTERNATIVE

Management Actions	1	2	3	4	5	6	7	8
Limit motorized use (within corridors or routes) within Mojave desert tortoise habitat west of the UPRR tracks.				X				
Prohibit camping within Mojave desert tortoise habitat.			X					
Allow camping within designated areas of Mojave desert tortoise habitat.				X				X
Open Mojave desert tortoise habitat to all motorized use.							X	
Limit motorized use (corridors or routes) within BLM sensitive species habitat west of the UPRR tracks.				X				
Prohibit camping within BLM sensitive species habitat.			X					
Allow camping in designated areas within BLM sensitive species habitat.				X				X
Open BLM sensitive species habitat to all motorized use.							X	
Prohibit commercial or personal collection of special status species. Allow research collection by permit only.		X	X	X	X	X	X	X
Follow prescriptions in recovery plans for federally listed species.		X	X	X	X	X	X	X

Note: Special Status Species include BLM Sensitive Species.

2.3.7.2 Federally Listed Species and Designated Critical Habitat

The ESA of 1973 calls for preparation of recovery plans for threatened and endangered species likely to benefit from the effort, and authorizes the Secretary of the Interior to appoint recovery teams to prepare the plans. The USFWS is the responsible agency for writing and overseeing the recovery plan. A recovery plan establishes recovery goals and objectives, describes site-specific management actions recommended to achieve those goals, and estimates the time and cost required for recovery. A recovery plan is not self-implementing, but presents a set of recommendations for managers and the general public, which are endorsed by an approving official of the DOI. Recovery plans also serve as a source of information on the overall biology and status of and threats to a species. The BLM is using these recovery plans for listed species to address threats and propose conservation measures within the Planning Area.

USFWS has provided a list of two federally listed species known to occur or with the potential to occur within the Planning Area: PMV (*Astragalus magdalenae* var. *peirsonii*), and Mojave desert tortoise (*Gopherus agassizii*; USFWS 2009).

2.3.7.2.1 Peirson's Milk-vetch (Threatened)

The overall recovery objective for the PMV is to provide habitat capable of maintaining stable or increasing trends in abundance and survivorship.

Goals and Objectives

- Promote population increase and protect habitat necessary to promote recovery.
- Provide for habitat connectivity between PMV populations throughout the dunes.
- Ensure no adverse modification of critical habitat.
- Achieve stable or increasing populations of PMV over time with adequate pollination, nurse plants, recruitment, and survivorship. Maintain desired habitat conditions or restore degraded habitats to promote pollinator success and survival.
- Minimize effects resulting from human-caused disturbances.

Management Actions Common to All Alternatives

- Promote research activities to further management goals of PMV.
- Implement a monitoring plan for PMV. Analyze the monitoring data to compare the trend in species abundance due to the different types of impacts in each area.

Management Actions by Alternative

Table 2-5 presents the management actions for PMV that vary by alternative.

TABLE 2-5
MANAGEMENT ACTIONS FOR PEIRSON'S MILK-VETCH BY ALTERNATIVE

Management Actions	1	2	3	4	5	6	7	8
Provide for recovery of PMV through critical habitat protection.	X	X	X	X	X	X	X	X
Continue current administrative closures limiting motorized use, including PMV critical habitat (existing and future designated).		X						
Prohibit motorized use within PMV critical habitat.			X		X			X
Prohibit camping within the Dunebuggy Flats Campground if rainfall threshold (Appendix E) is met for PMV critical habitat.								X
Open some areas of PMV critical habitat (existing and future designated) to motorized use and prohibit motorized use in other areas of critical habitat.	X	X				X	X	
Open some areas of critical habitat (existing and future designated) with some limited motorized use (seasonal closures, nighttime closures).				X				
Exclude PMV critical habitat from solar energy development.			X					X
Exclude PMV critical habitat from wind energy development.			X					X
Exclude PMV critical habitat from all other types of land use authorization.			X					X
Classify PMV critical habitat as an avoidance area for solar energy development.		X		X	X	X		
Classify PMV critical habitat as an avoidance area for wind development.		X		X	X	X		
Classify PMV critical habitat as an avoidance area for all other types of land use authorization.		X		X	X	X		
Open PMV critical habitat to solar development.							X	
Open PMV critical habitat to wind development.							X	
Open PMV critical habitat to all other types of land use authorization.							X	

2.3.7.2.2 Mojave Desert Tortoise (Threatened)

The overall recovery objective for the Mojave desert tortoise is to provide habitat capable of maintaining stable or increasing trends in abundance and survivorship of Mojave desert tortoise in all recovery units in the Mojave region. The Planning Area partially overlaps with the Eastern Colorado recovery units in southeastern California (BLM

2002b). Recovery goals, objectives, strategies, and delisting criteria are described in the Mojave Desert Tortoise Recovery Plan (USFWS 1994a).

Goals and Objectives

- Maintain and improve Mojave desert tortoise habitat.
- Promote population increase and protect habitat necessary to promote recovery.
- Provide for habitat connectivity between Mojave desert tortoise populations.
- Establish the goals and criteria for three categories of desert tortoise habitat areas (USFWS 1994a). These categories are:
    - Category I. Maintain stable, viable populations, retain natural shelter sites, protect existing tortoise habitat values, and increase populations where possible;
    - Category II. Maintain stable, viable populations and halt further declines in tortoise values; and
    - Category III. Limit tortoise habitat and population declines to the extent possible through mitigating impacts.

Management Actions Common to All Alternatives

The following management actions would apply to all Mojave desert tortoise habitat within the Planning Area and are derived from the Mojave Desert Tortoise Recovery Plan (USFWS 1994a).

- Review land use requests on a case-by-case basis. Requests may be denied or require mitigation to achieve Goals and Objectives.
- Compensate for loss of Mojave desert tortoise habitat in accordance with the Desert Tortoise Compensation Team report (1991).
- Limit activities that would fragment or further isolate existing populations of Mojave desert tortoises (e.g., canals, highways).
- Reduce the attraction of predators through proper management of garbage.
- Reduce take of Mojave desert tortoises, by injury or death, through proper mitigation measures.

2.3.7.3 State-listed Species

The BLM shall carry out management for the conservation of plants and animals listed by California. State laws protecting these species apply to all BLM programs and actions to the extent that they are consistent with FLPMA (43 USC 1701 et seq.) and other federal laws. BLM has policies that would assist California in achieving their management objectives for state-listed species. It is BLM policy to manage for the conservation of state-listed species and their associated habitats and to ensure that actions authorized, funded, or carried out do not contribute to the need to federally list these species as threatened or endangered.

There are four state-listed species found within the Planning Area: Algodones Dunes sunflower (*Helianthus niveus* var. *tephrodes*), Wiggins' croton (*Croton wigginsii*), Gila woodpecker (*Melanerpes uropygialis)*, and Arizona Bell's vireo (*Vireo bellii* var. *arizonae*).

2.3.7.3.1 Algodones Dunes Sunflower (State of California Endangered)

Algodones Dunes sunflower was listed as endangered in 1979. The Algodones Dunes sunflower is a rare perennial plant that lives in shifting sand habitats in the highest dunes. The BLM would adopt and implement, as practicable, any conservation strategies outlined by the CDFG for this species. Overall, the conservation objective is to provide habitat capable of maintaining stable or increasing trends in abundance of the Algodones Dunes sunflower.

Goals and Objectives

Maintain suitable habitat of sufficient quality and quantity that could support the Algodones Dunes sunflower.

Management Actions Common to All Alternatives

- Implement a monitoring plan for the Algodones Dunes sunflower. Analyze the monitoring data to compare the trend in species abundance due to the different types of impacts in each area.

Management Actions by Alternative

See Table 2-4 above for management actions by alternative for sensitive and special status species.

2.3.7.3.2 Wiggins' Croton (State of California Rare, CNPS-2)

Wiggins' croton was recognized by the State of California as rare (California Native Plant Society [CNPS]-2) in January 1982 (California Natural Diversity Database [CNDDB] 2001). Wiggins' croton is a perennial plant in the Euphorbiaceae family that thrives in shifting sand habitats. The BLM would adopt and implement, as practicable, any conservation strategies outlined by the CDFG for this species. Overall, the conservation objective is to provide habitat capable of maintaining stable or increasing trends in abundance of Wiggins' croton.

Goals and Objectives

Maintain suitable habitat of sufficient quality and quantity with adequate patch sizes that could support Wiggins' croton.

Management Actions Common to All Alternatives

Analyze impacts of all projects occurring within occupied Wiggins' croton habitat and require that projects mitigate the impacts accordingly.

2.3.7.3.3 Gila Woodpecker (State of California Endangered)

The Gila woodpecker was listed as endangered in 1988. The Gila woodpecker is found in Sonoran desert habitats where it nests in saguaro cacti as well as large mesquite and palo verde trees. The BLM would adopt and implement, as practicable, any conservation strategies outlined by the CDFG for this species. Overall, the conservation objective is to provide habitat capable of maintaining stable or increasing trends in abundance of Gila woodpecker.

Goals and Objectives

- Maintain suitable habitat of sufficient quality and quantity with adequate patch sizes that could support Gila woodpeckers.
- Maintain microphyll woodlands with large trees and sufficient recruitment that would support Gila woodpeckers.

Management Actions Common to All Alternatives

Analyze impacts of all projects occurring within occupied Gila woodpecker habitat and require that projects mitigate the impacts accordingly.

Management Actions by Alternative

See Table 2-4 above for management actions by alternative for sensitive and special status species.

2.3.7.3.4 Arizona Bell's Vireo (State of California Endangered)

Arizona Bell's vireo was listed as endangered in 1988. The Arizona Bell's vireo is a rare subspecies of the Bell's vireo that inhabits dense lowland shrub and mesquite brushlands. The BLM would adopt and implement, as practicable, any conservation strategies outlined by the CDFG for this species. Overall, the conservation objective is to provide habitat capable of maintaining stable or increasing trends in abundance of Arizona Bell's vireo.

Goals and Objectives

- Maintain suitable habitat of sufficient quality and quantity with adequate patch sizes that could support vireos.
- Maintain dense mesquite patches in microphyll woodlands that would support vireos.

Management Actions Common to All Alternatives

Analyze impacts to the Arizona Bell's vireo for all projects occurring within occupied Arizona Bell's vireo habitat and require that projects mitigate the impacts accordingly.

Management Actions by Alternative

See Table 2-4 above for management actions by alternative for sensitive and special status species.

2.3.7.4 BLM Sensitive Species

BLM sensitive plant species identified in the Planning Area are: Munz's cholla (*Opuntia munzii*), giant Spanish needle, sand food, Orocopia sage (*Salvia greatei*), spotted bat (*Euderma maculatum*), California leaf-nosed bat (*Macrotus californicus)*, cave myotis (*Myotis velifer*), Townsend's big-eared bat (*Plecotus townsendii*), burrowing owl (*Athene cunicularia*), LeConte's thrasher (*Toxostoma lecontei*), lowland (San Sebastian) leopard frog (*Rana yavapaiensis*), Couch's spade-foot toad (*Scaphiopus couchi*), flat-tailed horned lizard (*Phrynosoma mcallii*), and Colorado fringed-toed lizard (*Uma notata)*.

Per policy detailed in California BLM Manual Supplement 6840.06, all CNPS List 1B plant species that occur on BLM lands are considered to be BLM sensitive species (see Chapter 3, Section 3.7, Special Status Species). Species that are also listed by either the federal government or State of California are discussed above.

2.3.7.4.1 Goals and Objectives

Protect habitats of sensitive plant and wildlife species on BLM-administered lands to prevent the species from becoming listed under the ESA.

2.3.7.4.2 Management Actions Common to All Alternatives

- Allow collection of seeds of native plants to be used in rehabilitation and restoration activities.
- Manage consistent with the flat-tailed horned lizard range-wide management strategy.
- Implement a monitoring plan for BLM sensitive plants. Analyze the monitoring data to compare the trend in species abundance due to the different types of impacts in each area.
- Implement a monitoring plan for BLM sensitive wildlife species. Analyze the monitoring data to compare the trend in species abundance due to the different types of impacts in each area.
- Implement a monitoring plan for the flat-tailed horned lizard. Analyze the monitoring data to compare the trend in species abundance due to the different types of impacts in each area.
- Implement the Flat-tailed Horned Lizard Rangewide Management Strategy.
- Acquire lands from willing sellers within the East Mesa Management Area using compensation/mitigation funds.
- Protect habitat for BLM sensitive species whenever possible.

2.3.8 Wildland Fire Management

BLM coordinates with other agencies to manage fire in accordance with the nationwide BLM fire policy and the National Fire Plan. This integrates fire and fuels management with other land and resource management activities to benefit natural resources and implement multiple-use on BLM-administered lands within the Planning Area.

The Planning Area is located in the Palm Springs–South Coast El Centro Fire Management Zone and the Imperial Sand Dunes Recreation Area Fire Management Unit. BLM has the responsibility to provide a fire agency representative, fire prevention, law enforcement, and resource management on BLM-administered lands. BLM works to minimize impacts to resources from suppression activities and reduce rehabilitation costs from fire damage. The BLM identifies WAs, WSAs, and ACECs as special management units requiring additional consideration to protect the resources on these lands. The dunes are dominated by psammophytic scrub and creosote scrub and also contain scattered stands of microphyll woodland vegetation, some of which are thick with

closed canopies. These vegetation communities are not considered to be fire-adapted and must be managed accordingly.

2.3.8.1 Goals and Objectives

- Protect human life (both firefighters and public) and communities, property, and the natural resources on which they depend. Firefighter and public safety are the highest priority in all fire management activities.

- The management response to wildfire is appropriate to the values, risks, and other factors present. The management response may vary from aggressive suppression action to those actions that allow fire to function in its natural ecological role.

2.3.8.2 Management Actions Common to All Alternatives

- Implement fuels reduction programs where needed, with wildland fuels decreased and maintained at a manageable level, creating conditions conducive to safe, efficient, and effective firefighting. Fire and fuels management treatments may include fire suppression, prescribed fire, and non-fire treatments (manual, chemical, mechanical, or biological treatments). Treat non-native invasive species that constitute significant fuel load and fire threat directly by using Integrated Pest Management or management through fire breaks and other tactics.

- Identify, prioritize, and plan fuels reduction projects using a uniform system for determining wildland fire risk in wildland–urban interface (e.g., Risk Assessment and Mitigation Strategy).

- Identify and implement post-fire stabilization and rehabilitation actions in burned areas to restore a functional landscape to meet the natural resource management objectives.

- Apply the minimum impact management tactics, identified in the Interagency Standards for Fire and Aviation Operations, in the WA, when wildland fire suppression is required.

- Consider the desired conditions and management prescriptions in implementing fire management activities for ACECs (see Section 2.3.12.2 ACECs of this chapter).

- Utilize wildland fire suppression methods with lesser ground disturbance to minimize potential adverse impacts on special status species, critical habitat, desired plant communities, and cultural resources. Provide an on-site resource advisor to consult with the wildland fire responders on the location of sensitive resources and provide input to minimize impacts to those resources. When feasible, use of fire suppression techniques that minimize ground-disturbing impacts is desirable; however, reduction

of total acreage lost to fire, especially in critical habitat, through the use of mobile attack with engines, fireline construction with bulldozers, aerial fire retardant, or other necessary techniques is appropriate and requested.

- Use fire retardants or chemicals adjacent to waterways in accordance with the *Environmental Guidelines for Delivery of Retardant or Foam near Waterways: Interagency Standards for Fire and Aviation Operations* (National Interagency Fire Center 2009).

- Use wildland fire to achieve resource benefits whenever possible

2.3.9 Cultural Resource Management

The management of cultural resources on BLM land must be in compliance with several federal laws, including the Antiquities Act of 1906; the NHPA of 1966, as amended; the NEPA of 1969; EO 11593—*Protection and Enhancement of the Cultural Environment*; FLPMA of 1976; the American Indian Religious Freedom Act of 1978; the Religious Freedom Restoration Act of 1993; the Archaeological Resource Protection Act of 1979; the Native American Graves Protection and Repatriation Act of 1990; EO 13007—*Indian Sacred Sites*; and EO 13287—*Preserve America*. BLM also manages cultural resources in accordance with the National Programmatic Agreement (Among the Bureau of Land Management Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers Regarding the Manner in Which the BLM will Meet Its Responsibilities under the National Historic Preservation Act) of 1997. In addition, the BLM manages its cultural resources according to BLM manuals 8100 through 8170, and in accordance with the BLM-California SHPO Protocol Agreement of 2007, as amended. Locations of cultural resource sites are to be kept confidential with the exception of public use sites.

2.3.9.1 Goals and Objectives

- Identify, preserve, and protect significant cultural resources, districts, and landscapes and ensure that they are available for appropriate uses by present and future generations.

- Identify priority geographic areas for new field inventory, based upon a probability for unrecorded significant resources.

- Enhance public understanding of and appreciation for cultural resources through educational outreach and heritage tourism opportunities.

- Evaluate identified cultural resources under the criteria for the National Register of Historic Places (NRHP). Eligible resources would be formally nominated to the NRHP, as appropriate.

- Promote new survey efforts on an ongoing basis, utilizing partners where appropriate.
- Maintain viewsheds of important cultural resources whose settings contribute significantly to their scientific, public, traditional, or conservation values.
- Provide and encourage research opportunities on cultural resources that would contribute to the understanding of the ways humans have used and influenced natural systems and processes.
- Seek to reduce imminent threats, and direct and indirect impacts to cultural resources, and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses.
- Develop and deepen BLM consultation and coordination with Native American tribes.

2.3.9.2 Management Actions by Alternative

2.3.9.2.1 Alternative 1—No Action

Under Alternative 1 the existing decisions of the RAMP would continue to be implemented. These are:

- Provide for systematic monitoring of sensitive biological and cultural resources and recreational use, and development of management guidelines for resource protection.
- Minimize potential conflicts between recreational use and other resource uses of the recreation area.

2.3.9.2.2 Alternatives 2 through 8

Current legal, regulatory, and policy direction concerning cultural resources exists to protect and preserve these national heritage assets, as well as support development of literature, interpretive sites, and other forms of public education designed to increase knowledge, understanding, and enjoyment of these irreplaceable resources. Legal protection, physical preservation and restoration, documentation, and access by scientists and the general public are regulated by federal and state law. The electronic management and archiving of cultural data are vital to the management of these resources. The management actions presented here are a result of the need to update the existing plan and incorporate current legislation and policy direction for the management of cultural resources. These management actions apply to cultural resources in the Planning Area under Alternatives 2 through 8.

- Maintain current cultural resource data in a geographic information system (GIS) format and increase knowledge of cultural resources within the Planning Area through proactive surveys. The inventory would include a prioritized list (high/medium/low sensitivity) of areas for future inventory—based on sensitivity and the likelihood of significant, unrecorded sites. Inventory strategies for un-surveyed areas would be continually refined.

- Work cooperatively with the California SHPO on data sharing and information management, and the promotion and enhancement of public education, including Archaeological Awareness Week/Historic Preservation Month, outreach, and stewardship programs.

- Provide for and/or increase interpretive educational opportunities at selected cultural and historic sites, including the Plank Road. Work with communities, tribes, interested individuals, and other agencies to enhance public understanding, appreciation, and enjoyment of cultural resources.

- Implement protection measures to stop, limit, or repair damage to sites that are on or eligible for the National Register of Historic Places (NRHP). A variety of protection measures, described in BLM Manual 8140, may be used to protect the integrity of sites at risk such as signing, fencing or barriers, trash removal, erosion control, backfilling, repairing, shoring up or stabilizing structures, restricting uses and access, and closures. Where feasible, acquire properties within the Planning Area that contain significant cultural resources including, but not limited to, those properties eligible for or included on the NRHP.

- Manage spiritually significant and traditional cultural properties in consultation with Native American tribes, accommodate tribal access to spiritually significant and traditional cultural properties, and prevent physical damage or intrusions that might impede their use by religious practitioners. The locations of spiritually significant and traditional cultural properties and other places of traditional or religious importance to Native American tribes would be kept confidential to the extent allowed by law.

- Coordinate with Native Americans to manage harvesting areas for the collection of medicinal herbs, ceremonial herbs, other vegetation, and/or minerals for traditional or ceremonial use (See Section 2.3.5.4—Vegetative Use Authorization, of this chapter for more information).

- Evaluate and allocate cultural properties (including cultural landscapes) to one of six uses as outlined in BLM-IB No. 2002-101—*Cultural Resource Considerations in Resource Management Plans*.

2.3.9.3 Cultural Use Allocation

BLM evaluates cultural resources according to their current and potential uses (BLM Manual Section 8110 for Cultural Resources). Cultural resources are allocated to one or more of the following use categories: scientific use, public use, traditional use, conservation for future use, experimental use, and discharged from management. A site may be allocated to more than one use category.

Table 2-6 depicts typical use allocations for the various types of cultural resources found within the Planning Area. Scientific use is defined as resources preserved until research potential is realized; conservation for future use is defined as resources preserved until conditions for use are met; traditional use is defined as resources designated for long-term preservation; public use is defined as resources designated for long-term preservation and on-site interpretation; experimental use is defined as resources that will be protected until used; and discharged from management is defined as resources with no use after recordation and not to be preserved. The Plank Road (CA-IMP-4764H) is allocated to the Public Use and Conservation for Future Use categories. No properties are allocated to the discharged from management category at this time.

TABLE 2-6
USE ALLOCATIONS FOR CULTURAL PROPERTIES

Cultural Site Types	Scientific Use	Public Use	Traditional Use	Conservation for Future Use	Experimental Use
Lithic Scatters	X		X	X	
Ceramic Scatters	X		X	X	
Habitation/Temporary Campsites	X		X	X	
Ground stone scatters	X		X	X	
Cairn / Rock Alignments	X		X	X	
Trails	X		X	X	
Cleared Circle/Rock Rings	X		X	X	
Human Remains			X	X	
Historic Trash scatter/dumps	X			X	X
Military Encampments	X			X	
Historic Roads	X	X		X	
Canals	X	X		X	
Railroads	X	X		X	
Transmission Lines	X	X		X	
All other cultural properties, both known and projected, to occur throughout the plan area.	X			X	

Sites within the Planning Area would typically be allocated to one or more of the use categories presented in the table, although specific allocations of individual sites may be reevaluated and revised based on changing circumstances, or if any new or existing information regarding site attributes comes to light (e.g., site access, physical setting, site complexity, Native American consultation, and impacts to the site). In addition, all sites within the ACECs and the WA would be allocated to the conservation for future use and traditional use categories and would be managed appropriately for that class.

2.3.10 Paleontological Resource Management

Paleontological resources found on public lands are recognized by BLM as constituting a fragile and nonrenewable scientific record of the history of life on earth. They therefore represent an important component of America's natural heritage. All lands within the Planning Area have been classified as Class 2, moderate sensitivity, whose management concern is low and mitigation requirements are not likely.

BLM manages paleontological resources principally under the following authorities: BLM Manual 8270—*Paleontological Resources Management*; BLM Handbook 8270-1—*General Procedural Guidance for Paleontological Resources Management*; FLPMA of 1976, NEPA of 1969, Secretarial Order 3104, the Federal Cave Resources Protection Act of 1988, and other various laws and regulations.

2.3.10.1 Goals and Objectives

- Protect and conserve significant paleontological resources as they are discovered on public lands.
- Manage paleontological resources in ways that prioritize research needs, facilitate educational and recreational needs, and protect important sites.
- Develop specific objectives and management actions for fossil localities, when paleontological resources are discovered in the Planning Area.

2.3.10.2 Management Actions Common to All Alternatives

- Evaluate paleontological resources as they are discovered, considering their scientific, educational, and recreational values. Identify appropriate objectives, management actions, and allowable uses for fossil localities as they are found.
- Restrict the collection of all vertebrate fossils and noteworthy invertebrate and plant fossils to legitimate scientific or educational uses in accordance with permitting procedures.

- Allow recreational collecting of common invertebrate and plant fossils, in accordance with 43 CFR 8365.1-5.
- Notify BLM immediately should paleontological resources be encountered during project ground-disturbing activities, and cease work in the area of the discovery. Work may not resume until a written authorization to proceed is issued by BLM.
- In Class 3 areas, a field survey by a qualified paleontologist may be required. Management prescriptions for resource preservation and conservation through controlled access or special management designation would be considered. Surface-disturbing activities may require assessment in Class 2 areas to determine further courses of action. Assessment or mitigation in Class 1 areas would not be required except in very rare circumstances.

2.3.11 Visual Resource Management

BLM prepares and maintains on a continuing basis an inventory of visual values on all public lands in accordance with the Visual Resource Management (VRM) system (BLM 1984a). The VRM system provides a way to identify, evaluate, and determine the appropriate levels of management of scenic values. The inventory of visual values has been documented for the BLM-administered lands within the Planning Area and is described in Chapter 3, Section 3.11—Visual Resources. The inventory serves as the basis for the designation of VRM Classes I–IV, which takes into account other resource uses on public lands within the Planning Area. The VRM classes are best defined by their goals and objectives, which are described below. The overall goal of VRM analysis is to minimize visual impacts through development of mitigating measures.

The following criteria were used to determine the proposed VRM Class designations for the various DRAMP alternatives:

- The overall management emphasis intended for each alternative
- Recognition of all applicable special designations and all land use decisions
- Assertion that other management activities and land uses proposed may be achieved within the applicable VRM Class
- Use of the least restrictive class that still achieves stated goals and objectives

2.3.11.1 Goals and Objectives

The DRAMP alternatives would set landscape classes ranging from Class I to IV, and all future projects and actions would adhere to the following VRM class objectives as appropriate:

Class I Objective. The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II Objective. The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III Objective. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV Objectives. The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic elements.

2.3.11.2 Management Actions Common to All Alternatives

- Incorporate design considerations to minimize potential impacts to public lands' visual values into all surface-disturbing activities, regardless of size. Proponents would be encouraged to meet with the BLM personnel to discuss and provide input during the initial planning and design phase to minimize costly redesign and mitigation at a later time.

- Evaluate proposed surface-disturbing activities in accordance with BLM VRM Handbook H-8431-1 Visual Contract Rating. Conduct a visual contrast analysis to ensure that projects meet the VRM class requirements for that area. This visual contrast analysis from Key Observation Points (KOPs) would consider the following factors: distance (between project and KOPs), angle of observation, length of time the proposed project would be in view, relative size or scale, season of use, light conditions, recovery time, spatial relationships, atmospheric conditions, and motion.

- Use visual resource design techniques and BMP (summarized in Appendix C) to mitigate the potential for short- and long-term visual impacts from other uses and activities until demonstrated to meet the VRM class objectives.

2.3.11.3 Management Actions by Alternative

A hierarchical approach was utilized in assigning VRM Classes. First, in accordance with BLM's national policies, the WA would be designated Class I under all alternatives. WAs require special consideration for the protection of their visual values due to management objectives to preserve the natural landscape setting. Lands immediately adjacent to wilderness would be designated Class II.

A Class II designation would be assigned to lands managed for Recreation and Public Purposes. These lands are managed to provide a relatively high level of natural landscape setting, while allowing for certain recreational components.

The BLM would encourage retrofitting of existing facilities to comply with the VRM Class objectives for that area by working in partnership with existing ROW holders (such as communication sites). Incorporate mitigation measures, such as repainting existing facilities, and carefully locating and designing new facilities (such as by using topographic screening) to minimize their contrast with the characteristic landscape.

ACECs would be designated as Class II or in some cases as Class III. Class III and IV designations were assigned to areas with high potential for renewable resource uses, areas that would be managed for high recreational value, and other areas which would continue to be managed primarily for habitat values, regardless of scenic quality.

VRM class designations vary by alternative, as shown in Table 2-7. VRM Class designations by alternative are presented on Maps 2-1 through 2-4.

TABLE 2-7
VRM CLASSES BY ALTERNATIVE

VRM Class	Alternative (acres)							
	1	2	3	4	5	6	7	8
I (acres)[1]	26,098	26,098	26,098	26,098	26,098	26,098	26,098	26,098
II (acres)	71,758	104,739	173,794	104,739	104,739	104,739	16,031	104,739
III (acres)	37,782	69,055	15,039	69,055	69,055	69,055	88,708	68,055
IV (acres)	28,571	15,039	0	15,039	15,039	15,039	84,094	15,039
Total	164,209[2]	214,930	214,930	214,930	214,930	214,930	214,930	214,930

[1] The acreages identified for VRM Class I represent the digital boundaries of the WA. These acreages may not coincide completely with those designated by Congress.
[2] Alternative 1 acreage reflects the lack of VRM inventory in the Planning Area previous to the current planning effort.

2.3.11.4 Management Zones

Zones are designations that represent landscapes, visitor use patterns, and management philosophy. Managers use zones to establish criteria to provide guidance

on how best to meet management objectives. The establishment of zones considers patterns of visitor use, visitor expectations, and resource characteristics and sensitivity. Within a zone, varying management techniques are prescribed to ensure the conservation, protection, and enhancement of resources, as well as traditionally public uses. Zoning as a management tool assists BLM in the plan implementation process by setting a framework within which day to day management decisions are made. Certain actions may be appropriate in one zone, but unacceptable in another zone. Stipulations for the issuance of Special Recreation Permits, or the management of dispersed recreation, could be based upon zone boundaries and management criteria. Zones would benefit resource management by providing guidance for broad geographical areas. This guidance would cover both visitor use and resource protection.

2.3.11.4.1 Primitive Zone

Goals and Objectives

Manage the VRM Class I area (North Algodones Dunes WA) as a Primitive Zone.

Management Actions Common to All Alternatives

Conduct visual contrast ratings to ensure that all projects meet VRM Class I requirements.

2.3.11.4.2 Backcountry Zone

Goals and Objectives

Manage VRM Class II areas as a Backcountry Zone.

2.3.11.4.3 Frontcountry Zone

Goals and Objectives

Manage VRM Class III and VRM Class IV areas as a Frontcountry Zone.

Management Actions Common to All Alternatives

Conduct contrast ratings to ensure that all projects meet the VRM class III objectives, and for projects within VRM Class IV areas ensure that they are visually mitigated to minimize visual impact through adaptive design principles working with form, line, color, and texture that repeat the elements of the natural landscape setting.

2.3.12 Special Designations

Special Designations within the Planning Area include one WA and three ACECs.

Through the planning process, BLM designates ACECs following the criteria outlined in law (FLPMA), regulations (43 CFR 1610.7-2), and policy (Manual 1613).

2.3.12.1 Wilderness Areas

There are 26,098 BLM-administered acres of designated WA in the Planning Area. WAs are designated by Congress and are managed according to the Wilderness Act (16 USC 1131-1136, 78 Stat. 890), the CDPA of 1994, regulations for wilderness management at 43 CFR 6300, Wilderness Management Policy (BLM 1981), BLM manuals 8560 and 8561 and BLM Handbook H-8560-1. This land-use plan will not address changing or eliminating existing WA boundaries or allowing motorized vehicles or other use of mechanical transportation in any WA not already authorized. Only Congress can change the boundaries of designated WAs.

2.3.12.1.1 Goals and Objectives

- Provide for the long-term protection and preservation of the area's wilderness character under the principle of non-degradation. The area's naturalness and untrammeled condition, opportunities for solitude, opportunities for primitive and unconfined types of recreation, and any ecological, geological, or other features of scientific, educational, scenic, or historic value would be managed so that they remain unimpaired.

- Meet minimum requirements necessary for the administration of the area for the purpose of the Wilderness Act (including measures required in emergencies involving the health and safety of persons within the area).

- Manage any newly designated WAs in accordance with the designation authority.

2.3.12.1.2 Management Actions Common to All Alternatives

Continue to provide monitoring, signing, and restoration as necessary.

Some relevant management provisions provided for by law or policy for these areas are:

- Withdrawal from mineral entry, mineral leasing, and mineral sales

- No use of motor vehicles, motorized equipment, or other form of mechanical transport

- No structure or installation within these areas

- Administrative structures (e.g., trail markers or informational kiosks) and use of vehicles and structures would be the minimum necessary for the administration of these areas

- Prescribed fire may be used: 1) to reintroduce or maintain the natural condition of a fire-dependent ecosystem, 2) to restore fire where past strict fire control measures had interfered with natural ecological processes, 3) where a primary value of a given wilderness would be perpetuated as a result of burning, or 4) where it would perpetuate threatened and endangered species (MS-8560.35)

2.3.12.2 Areas of Critical Environmental Concern

BLM is evaluating three pre-existing ACECs under various alternatives in the DRAMP (see Maps 2-5 through 2-6). The preferred alternative (Alternative 8) would continue the 298-acre Plank Road ACEC to protect cultural resources and other resource values identified in the DRAMP. The preferred alternative would reduce the East Mesa ACEC from 6,454 acres to 5,802 acres, which overlap within the Planning Area. The East Mesa ACEC would continue to protect biological resources and other resource values identified in the DRAMP. The preferred alternative would also remove the North Algodones Dunes ACEC, which encompasses 25,756 acres, to eliminate conflicting management prescriptions between this ACEC and the North Algodones Dunes WA. Limitations on use of public lands within the Plank Road ACEC include restrictions on wind and solar energy development, as well as geothermal leasing. Limitations on use of public lands within the East Mesa ACEC include restrictions on wind and solar energy development, as well as geothermal leasing that include surface occupancy. The guidance for ACEC designation is included in FLPMA and the BLM planning regulations. ACECs must meet the relevance and importance criteria in 43 CFR 1610.7-2(b) and must require special management (43 CFR 1601.0-5[a]) to:

- Protect the area and prevent irreparable damage to resources or natural systems
- Protect life and promote safety in areas where natural hazards exist

Areas qualifying for consideration as ACECs must have substantial significance and value, including qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. The values for which ACECs are designated are considered the highest and best use for those lands and protection of those values would take precedence over multiple uses.

2.3.12.2.1 Goals and Objectives

ACECs would provide protection for relevant and important special status species, wildlife, scenic, and significant cultural resources values.

2.3.12.2.2 Management Actions Common to All Alternatives

- Ensure land use authorizations approved in ACECs are consistent with the actions presented in Section 2.3.16—Lands and Realty Management of this chapter.

- Ensure mineral management actions authorized in ACECs are consistent with the actions presented in Section 2.3.16—Lands and Realty Management of this chapter.
- Retain the ACEC in public ownership and seek to acquire non-federal lands and interests in lands within the ACECs from willing sellers by purchase, exchange, or donation. Future acquisitions of in-holdings and edgeholdings would be managed in accordance with the designated ACEC. See Land Tenure in Section 2.3.16.1 for additional information.
- Allow treatment for hazardous fuels and non-native invasive or pest species.
- Prohibit wood collection in all ACECs.
- Allow traditional use by Native Americans consistent with Vegetative Use Authorization (see Section 2.3.5.4—Vegetative Use Authorization of this chapter).
- Monitor resources within the ACECs to detect change and prevent future deterioration.
- Acquire in-holdings from willing owners.
- Perform restoration treatments where damage has occurred or where it will reduce vehicle incursions.

2.3.12.2.3 Designations of ACECs by Alternative

Potential ACEC designations by alternative are quantified below in Table 2-8 and shown in Maps 2-5 and 2-6. The range of alternatives is based on the following:

TABLE 2-8
ACECS BY ALTERNATIVE (ACRES)

ACEC	Alternative							
	1	2	3	4	5	6	7	8
Plank Road	298	298	298	298	298	298	298	298
East Mesa	6,454	6,454	5,802	5,802	5,802	5,802	5,802	5,802
North Algodones Dunes	25,756	25,756	0	0	0	0	0	0
Total[1]	32,509	32,509	6,097	6,097	6,097	6,097	6,097	6,097

[1] ACECs may include private in-holdings located within the boundaries of the ACECs. BLM's land-use decisions and management actions only apply to BLM-administered lands within the ACECs. Acres presented include BLM-administered lands within the Planning Area only. Inconsistencies in acres may be due to GIS data and rounding.

Alternatives 1 and 2

The Plank Road, East Mesa, and North Algodones Dunes ACECs remain as they were originally designated.

Alternatives 3, 4, 5, 6, 7, and 8

The original North Algodones Dunes ACEC is removed because it overlaps the North Algodones Dunes WA. BLM strives to manage the area to the highest protection possible and to avoid management regime overlap. The Plank Road ACEC remains as it was originally designated. The East Mesa ACEC would be reduced from 6,454 acres to 5,802 acres under these alternatives in order to eliminate overlap with the ISD SRMA.

Table 2-9 provides the management actions by alternatives for special designations.

TABLE 2-9
MANAGEMENT ACTIONS FOR SPECIAL DESIGNATIONS BY ALTERNATIVE

Management Actions	1	2	3	4	5	6	7	8
Wilderness Areas								
Expand access by improving staging areas at WA access points.	X			X	X		X	X
Continue current level of access at WA access points.		X	X			X		
Provide new informational kiosks at WA access points.	X			X	X			X
Maintain current informational kiosks at WA access points.		X	X			X	X	
Areas of Critical Environmental Concern								
Reduce acreage of East Mesa ACEC in order to eliminate overlap with the ISD SRMA.			X	X	X	X	X	X
Exclude ACEC(s) from solar energy development.[1]			X					X
Exclude ACECs from wind energy development.			X					X
Classify ACECs as avoidance areas for solar energy development.		X		X	X	X		
Classify ACECs as avoidance areas for wind energy development.		X		X	X	X		
Open ACECs to solar energy development.							X	
Open ACECs to wind energy development.							X	
Classify ACECs as avoidance areas for all land use authorizations other than for solar and wind development.				X	X	X		

[1] Avoidance area is defined as an area only available for discretionary land-use authorizations when there are no other reasonable alternatives for the authorization. Exclusion area is defined as an area that is not available for discretionary land use authorizations.

2.3.13 Mineral Resource Management

ECFO manages mineral resources in accordance with BLM's National Mineral Policy, the Energy Policy Act, and the National Energy Policy. Development of mineral resources from public lands managed by the BLM is directed by Congress through

various enabling laws under three general categories: locatable minerals, leasable minerals, and salable minerals.

2.3.13.1 Management Actions Common to All Alternatives

- Consolidate, through land tenure adjustments, surface and subsurface (minerals) estates under single ownerships when possible, thereby improving manageability of the federal lands involved. Consolidate split-estate pursuant to Sections 205 and 206 of FLPMA.

- Require a notice when mechanical equipment is used for exploration or processing, and cumulative disturbance is less than 5 acres.

- Require mining plans of operations where disturbance is greater than 5 acres and/or where bulk sampling would remove 1,000 tons or more.

- Require an investigation and a report to determine the validity of the mining claim prior to approval of a mining plan of operations in withdrawn areas.

- Require a mining plan of operations in any special designation in accordance with existing 43 CFR 3809 regulations.

- Require mining plans of operation in areas designated as closed to OHV recreation and in lands or waters known to contain federally listed threatened or endangered species or proposed or designated critical habitat.

- Require a notice for review or a plan of operations for approval for any surface disturbance associated with casual use activity in designated critical habitat causing more than negligible disturbance.

- All mining disturbances created after the plan of operations would be reclaimed to meet the surrounding natural environment. Mining activities would be in compliance with all State of California reclamation requirements, particularly the Surface Mining and Reclamation Act.

- The WA is withdrawn from all forms of entry, appropriation, or disposal under the public land laws.

- In highly sensitive areas, where special stipulations are not sufficient to protect surface resource values, including recreation, special status species, and special designations, stipulations for no surface occupancy for leasable mineral development may be attached to the lease.

- Manage consistent with the Flat-tailed Horned Lizard Range-wide Management Strategy.

- Issue mineral material sales or free use permits on a case by case basis in the Limited Use ERMA but consistent with applicable land use plans.

2.3.13.2 Management Actions by Alternative

Table 2-10 lists the management prescriptions that vary by alternative as they affect access to and development of mineral resources within the Planning Area.

TABLE 2-10
POTENTIAL MINERAL RESOURCE DECISIONS BY ALTERNATIVE

Mineral Resources	1	2	3	4	5	6	7	8
Locatable								
Propose withdrawal of the ACEC(s) and critical habitat from mineral entry.			X	X	X	X		
Maintain ACEC(s) as open to mineral entry under the Mining Law, subject to Section 7 and Section 106 consultations.	X	X					X	X
Propose withdrawal of ISD SRMA from mineral entry.			X					
Maintain the ISD SRMA, excluding the WA, as open to mineral entry under the Mining Law, subject to Section 7 and Section 106 consultations.	X	X		X	X	X	X	X
Leasable								
Classify the flat-tailed horned lizard management area as available for geothermal leasing, but with an NSO stipulation.								X
Classify the Limited Use Area ERMA (excluding flat-tailed horned lizard management area) as available for geothermal minerals leasing.								X
Open the entire Planning Area, with the exclusion of the WA, to geothermal minerals leasing, but with an NSO stipulation.				X				
Open the entire Planning Area, with the exclusion of the WA, to geothermal minerals leasing and surface occupancy.	X	X					X	
Allow geothermal mineral leasing on nominated lands under 43 CFR 3203.10.					X	X		
Prohibit geothermal minerals leasing within the entire Planning Area.			X					
Exclude donated lands from geothermal minerals leasing.								X
Exclude ISD SRMA from geothermal minerals leasing.								X
Prohibit surface occupancy within critical habitat, ACEC(s), other special area designations, and camping and staging areas.		X	X	X	X	X	X	X
Prohibit surface occupancy within the ISD SRMA.			X					
Salable								
Prohibit mineral sales or free use permits within the ISD SRMA.			X					X

2.3.13.3 Locatable Minerals

Minerals subject to location under the General Mining Law of 1872 (30 USC 22, et seq.; as amended) include metallic minerals such as gold, silver, copper, lead, zinc, and uranium; non-metallic minerals such as asbestos, barite, gypsum, and mica; and uncommon varieties of stone (43 CFR 3800). The General Mining Law of 1872 allows citizens and those seeking to become citizens of the US the right to enter upon public lands and reserved interests for the purposes of exploration and development of minerals subject to this mining law. Appropriation of a mineral deposit is made by location of a mining claim. No rights under the mining laws can be exercised by a claimant until a discovery of a valuable mineral deposit has been made within the boundaries of the mining claim.

Exploration and development must be conducted in accordance with all applicable laws, regulations, and policies, and in conformance with the approved land-use plan. Restrictions and stipulations may be applied to a proposed activity based on review and analysis by the authorized officer.

All activity is managed under the authority of the regulations at 43 CFR 3809 (public lands and WAs) and 43 CFR 3802 (WSAs). Authorization is based on the level of disturbance and whether the activity is conducted in a special designation area. Casual use activities such as panning for gold, prospecting, and monumentation of mining claims, are authorized by the regulations where disturbance will be nominal. No approval is required from the authorized officer of the BLM. Where exploration activities would cause more than nominal disturbance and surface disturbance is 5 acres or less, a notice is required to be reviewed by the authorized officer of the BLM to assure that unnecessary or undue degradation would not occur to public lands or resources. A plan of operations is required for surface disturbance greater than 5 acres in a special area or for mining activity greater than casual use. A plan of operations must be approved by the authorized officer of the BLM and may be subject to stipulations to assure conformance with the land-use plan.

BLM manages to protect sensitive resources by defining protective prescriptions in land-use planning that are to be applied in any approval of activities. Where mineral development activity would adversely affect sensitive resource values, the BLM may petition for withdrawal an area from the operation of the mining laws. Withdrawals greater than 5,000 acres must have congressional review and approval.

The BLM must make public land and resources available for prospecting and location of valuable (locatable) mineral deposits to meet local, regional, and national needs for metals and industrial minerals, and protect sensitive resource values.

2.3.13.3.1 Goals and Objectives

Provide opportunities for exploration, location, and development of mining claims and sites while preventing unnecessary or undue degradation of public lands and resources.

2.3.13.3.2 Management Actions by Alternatives

Salable minerals materials would be available as described in Table 2-10 above, which provides management actions that vary by alternative.

2.3.13.4 Leasable Minerals

Leasable minerals include fluid energy mineral deposits such as oil, gas, coal bed methane, carbon dioxide (CO_2), and geothermal resources, as well as solid energy and industrial minerals such as coal, sodium, and potash. Although not a leasable mineral, helium is included in this category, because it is typically associated with CO_2 exploration and development (43 CFR 3100 and 43 CFR 3200).

Laws and regulations applicable to federal leasing in the Planning Area include:

- Mineral Leasing Act of 1920 as amended and supplemented
- Acquired Lands Mineral Leasing Act of 1947
- Mining and Minerals Policy Act of 1970
- Federal Onshore Oil and Gas Leasing Reform Act of 1987
- 43 CFR 3100 (Oil and Gas Leasing)
- 43 CFR 3200 (Geothermal Resources Leasing)
- BLM Manual Series 3100—*Onshore Oil and Gas Leasing* (and handbooks)

BLM defines geothermal resources as renewable energy fluid minerals that can be developed after obtaining a lease from BLM. Regulations applicable to geothermal leasing of federal minerals in the Planning Area include but are not limited to:

- Geothermal Steam Act of 1970
- 43 CFR 3200

The lease is a right to access and develop mineral resources contained within the boundaries of the leased area in compliance with the lease terms and in conformance with appropriate local, state, and federal laws and regulations. Where information is necessary to classify lands as valuable to the public for minerals subject to the leasing laws, prospecting permits may be authorized before leases would be approved. Where mineral deposits subject to leasing are known to be valuable, BLM may offer to lease through competition. Competitive leasing is required for all oil and gas. Leases are typically termed for 20 years and are extended as long as in producing status. A payment of an annual rental and or a royalty for minerals produced is made to the US by the lessee.

In some situations where sensitive resource values occur, a lease may be issued with a no surface occupancy (NSO) requirement. This requirement must assure that the mineral deposit on the lease could be developed by means of off-site development.

A determination that lands are available for leasing represents a commitment to allow surface use under standard terms and conditions, unless stipulations constraining development are attached to leases. When applying leasing restrictions, the least restrictive constraint to meet the resource protection objective would be used.

For reserved mineral interests on private land, leasing of federal mineral estate on lands where the surface is not held by the federal government would be done in accordance with federal law, regulations, and policy guidance. The surface owner would be notified prior to lease and given the opportunity to comment.

2.3.13.4.1 Goals and Objectives

Provide opportunities for mineral leasing while preventing unnecessary or undue degradation of public lands.

2.3.13.4.2 Management Actions by Alternative

Leasable minerals would be available as described in Table 2-10 above. Table 2-11 provides the acreages of lands available for potential geothermal minerals leasing by alternatives. Maps 2-7 through 2-11 show land available for geothermal minerals leasing by alternative. See Appendix F for a comparison by alternative of lands available for geothermal, solar, and wind energy development.

TABLE 2-11
LAND AVAILABLE FOR GEOTHERMAL MINERALS LEASING BY ALTERNATIVE (ACRES)

	Alternative							
	1	2	3	4	5	6	7	8
Available	188,832	188,832	0	0	11,939	11,939	188,832	35,115
Not Available	0	0	188,832	0	176,894	176,894	0	139,691
Available, but with an NSO stipulation	0	0	0	188,832	0	0	0	14,025
Total	188,832	188,832	188,832	188,832	188,832	188,832	188,832	188,832

Note: Inconsistencies in acres may be due to GIS data and rounding.

2.3.13.5 Salable Minerals

Salable minerals include construction materials such as sand, gravel, cinders, decorative rock, and building stone as described in (43 CFR 3600). Laws and regulations applicable to salable minerals on public lands in the Planning Area include:

- Acquired Lands Mineral Leasing Act of 1947
- Mineral Materials Act of 1947 as amended
- FLPMA; and 43 CFR Part 3600
- Surface Resources Act of 1955
- BLM Handbook H3042-1—*Solid Minerals Reclamation Handbook*
- BLM Manual and Handbook 3600

Disposal of mineral materials from BLM-administered lands requires either a sales contract or a free use permit from the appropriate BLM office. Disposal of mineral materials is authorized in accordance with appropriate laws, regulations, and policies in conformance with the approved land-use plan and if disposal is determined to be in the public interest. Use of public lands and resources for salable mineral development cannot be allowed, if not in the public interest and if such action would result in unnecessary or undue degradation to public lands or resources.

Public lands would be available for disposal of salable mineral materials at the discretion of the authorized officer.

2.3.13.5.1 Goals and Objectives

- Prevent unnecessary or undue degradation of public lands.
- Respond appropriately to increasing demand for mineral materials in the Planning Area.
- Provide mineral materials on a case-by-case basis for infrastructure development.

2.3.13.5.2 Management Actions by Alternative

Salable minerals materials would be available as described in Table 2-10, which provides management actions that vary by alternative.

2.3.14 Recreation Resource Management

There are several regulations, laws, policies, and guidelines that authorize and direct BLM recreation management activities. FLPMA originally mandated that the BLM was to manage outdoor recreation resources on public lands. Section 202(c)(9) of FLPMA calls for land use planning consistent with Statewide Comprehensive Outdoor Recreation Plans. FLPMA's implementing regulations enable the BLM to collect Special Recreation Permit (SRP) fees.

Recreation within the Planning Area is also managed under the *National Management Strategy for Motorized OHV Use on Public Lands* (BLM 2001a) and under the Recreation Element of the CDCA Plan.

2.3.14.1 Goals and Objectives

The majority of visitation to the Planning Area is associated with motorized camping and OHV recreation. However, other recreational activities such as hunting, hiking, wildflower and wildlife viewing, bird watching, photography, and commercial uses also occur to a lesser degree. As such, the majority of public lands within the Planning Area have recreation opportunities that can be appropriately managed while conserving natural and cultural resources as prescribed by the BLM's multiple-use mission and planning documents. The BLM's *Priorities for Recreation and Visitor Service* states:

> Our multiple use mission is to serve the diverse outdoor recreation demands of visitors while helping them to maintain the sustainable conditions needed to conserve their lands and their recreation choices. Our vision is to provide the services that will open up new opportunities for people to recreate responsibly in their great outdoors. Our goal is to provide opportunities for environmentally responsible recreation. (BLM 2003b)

This recreation and visitor services blueprint for the future also sets three primary goals for the BLM recreation program:

1. Improve access to appropriate recreation opportunities on DOI-managed or DOI-partnered lands.

2. Ensure a quality experience and enjoyment of natural and cultural resources on DOI-managed or DOI-partnered lands.

3. Provide for and receive fair value in recreation.

To meet the specific needs and changing demands of recreation visitors and changes in BLM recreation management, a California-specific *Recreation and Visitor Services Strategy* was completed in 2008 (BLM 2008d). The strategy outlined a framework with specific goals, objectives, and actions to be implemented. The three primary goals of the document were designed to increase public land stewardship through consistent and coordinated management of the BLM California recreation program in order to achieve the best possible balance of recreational uses and land health standards statewide. The three primary goals are to:

1. Set a framework for achieving sustainable experiences and quality of life outcomes for individuals, communities, and the environment

2. Sustain diversity, distinctive character, and capacity of BLM recreation settings

3. Increase the economic stability and sustainability of the BLM California recreation program

The seven main objectives for BLM recreation management in California are to:

1. Manage for recreation experiences and quality of life

2. Encourage sustainable travel/tourism collaborations

3. Fair value and return through fees and commercial services

4. Establish a comprehensive approach to travel management

5. Public health and safety and improve accessibility

6. Enhance and expand visitor services

7. Encourage and sustain collaborative partnerships

2.3.14.2 General Management Actions Common to All Alternatives

- Develop or retrofit facilities to accommodate visitation and meet agency requirements.
- Design all new facilities to meet the social needs of the visitors and the management needs of the BLM.
- Provide a minimum of recreational facilities. Those facilities should emphasize resource protection and visitor safety.
- Determine if existing facilities meet accessibility standards, management objectives, and desired future conditions. Existing facilities deemed critical would be maintained and/or modified to be accessible, to the extent possible, and safe for visitor use. Facilities not meeting management objectives and accessibility standards would be considered for removal.
- Collect recreation fees.
- Collect SRP fees for commercial and non-commercial activities under the authority of the Federal Lands Recreation Enhancement Act (FLREA) and other applicable regulations and BLM policy.
- Conduct a visitor survey to provide public input on safety, natural and cultural resources concerns, and management of the Planning Area. Implement a visitor and OHV recreation survey.
- Work cooperatively with the OHV community, the environmental community, and other local, state, and federal agencies to develop and implement interpretive and public relations programs about issues and resources related to the Planning Area.
- Develop and maintain educational programs which may include on-the-ground improvements such as signs and interpretative kiosks, partnerships, and educational materials throughout the Planning Area as funding allows.
- Provide quality informational and interpretive materials and programs to enhance the visitor's knowledge of the Planning Area's flora, fauna, historic, recreational, and other significant resources and opportunities. Emphasize the use of public information and education techniques to increase public awareness, enjoyment, and sensitivity to desert resources.
- Consider utilization of concessionaire(s) to manage certain activities and uses in the Planning Area within the framework of the ISD RAMP.

- Develop ways of using concessions to help maintain or operate recreation areas.
- Protect at-risk cultural and historical resources from recreational damage as needed throughout the Planning Area. Work together with new and existing groups to foster partnerships that accomplish BLM goals and objectives.
- Prohibit collection of wood for home heating purposes.
- Prohibit burning wood with non-combustible items (pallets).
- Maintain and/or develop volunteer campground host program in appropriate areas.
- Prohibit vending in all areas closed to OHV recreation and in limited use areas.
- Create an environment to promote the health and safety of visitors, employees, and nearby residents by working with local, state, and federal agencies and interest groups.
- Manage recreational use to minimize user conflicts, provide a safe recreation environment, and protect desert resources.
- Engage communities, including key enthusiasts, in the resolution of health and safety issues/other conflicts at BLM recreational sites or areas.
- Improve capacity to inform visitors about safety concerns (e.g., facilities, fire), environmental conditions, and emergency situations, both on-site and by using web-based and other technologies.
- Work with law enforcement officers and public affairs staff when possible to publicize vandalism and convictions.
- Get involved in community-based planning to address mutual needs including communities (all local governments), service-providing businesses, and the BLM.
- Engage chamber of commerce/tourism groups, outdoor businesses, heritage organizations, outfitters, other private recreation providers, and organized groups for ideas and ways to disseminate information regarding suitable visitor destinations on public lands, maps, and user ethics.
- Develop and maintain partnerships that fulfill local needs while balancing recreational demands in administering public lands.
- Continue and enhance partnerships with other federal and state agencies, such as the Department of Defense (DOD), California State Parks, and CDFG.

- Adjust management approach to accommodate changing visitor use patterns and preferences.

- Incorporate the idea of climate change into planning so that recreational experiences may be directed toward reducing the carbon footprint. Monitor economic changes (such as higher fuel prices) to leverage funding for eco-friendly recreation. Engage the business community and local governments in collaboratively planning and managing for sustainable recreation–tourism use of public lands that meet or exceed land health standards, addressing needs of visitors and resident customers.

- Continue working with the business community, organized recreation groups, outfitters, communities, and interested individuals to instill a sense of pride and caring for public lands.

- Expand visitor education regarding a "pack it in, pack it out" policy. Continue to educate the public regarding *Leave No Trace* ethics.

- Develop GIS mapping for travel management plans and make maps available on the internet and by hard copy.

- Identify transportation routes for recreation purposes to include opportunities and quality experiences for all user groups, including hikers, backpackers, equestrians, bicycles, motorcycles, OHVs, four-wheel-drive vehicles, and hunters. However, this should not be interpreted that all users would be accommodated in all areas.

- Use alternative funding sources (such as Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy for Users) to partner with local groups to further transportation planning.

- Allow camping and OHV recreation within the Dunebuggy Flats Campground.

2.3.14.3 Management Actions by Alternatives

Table 2-12 presents the management actions for recreation management that vary by alternative. See Appendix F for a comparison by alternative and issue of recreation management actions.

TABLE 2-12
RECREATION MANAGEMENT ACTIONS BY ALTERNATIVE

Management Actions	1	2	3	4	5	6	7	8
Allow camping and OHV recreation within some of the microphyll woodlands south of SR-78 and north of I-8.	X	X	X		X	X	X	X
Prohibit camping in the Dunebuggy Flats Campground if rainfall threshold (Appendix E) for PMV is met.								X
Prohibit camping within the microphyll woodlands south of Wash 25 and north of Wash 69. OHV recreation would continue to be allowed in this area.								X

2.3.14.3 Recreation Management Areas

BLM identifies SRMAs where the resources of the public lands attract visitors from one of the three following recreation markets:

- Public lands with a demonstrated *community* recreation–tourism market would be managed as a Community SRMA. A Community SRMA is managed in collaboration with the local community to primarily benefit the local residents.

- Public lands with a demonstrated *destination* recreation–tourism market would be managed as a Destination SRMA. A Destination SRMA is managed as a regional or national destination through collaborative partnerships.

- Public lands with a demonstrated *undeveloped* recreation–tourism market would be managed as an Undeveloped SRMA. An Undeveloped SRMA is managed to maintain dispersed and undeveloped recreation opportunities.

The ISD will be managed as a Destination SRMA. BLM lands outside of SRMAs must be managed as ERMAs. Recreation management within ERMAs would be limited to custodial actions only. Custodial actions are those necessary to manage dispersed activities, visitor health and safety, and user and resource conflicts. Currently, the Limited Use Area ERMA is managed under WECO within the west portion and NECO within the east portion.

There would be only one SRMA designated within the Planning Area. The ISD SRMA encompasses 164,209 acres (including the North Algodones Dunes WA) of BLM-administered lands (Map 2-12). There is one ERMA within the Planning Area. The Limited Use Area ERMA extends beyond the SRMA boundary into the NECO and WECO planning areas. This planning effort will address impacts to the area one mile beyond and parallel to the ISD SRMA boundary, encompassing 50,722 acres of BLM-administered lands (Map 2-12).

2.3.14.3.1 Imperial Sand Dunes SRMA

The ISD SRMA currently includes the WA and the Plank Road ACEC special designations. The ISD SRMA boundaries are the US-Mexico border to the south, the Coachella Canal to the west (for the most part), the UPRR to the east (along with portions of Ogilby Road and the All-American Canal), and the Mammoth Wash area to the north where the dunes terminate (see Map 2-12).

The ISD SRMA would be managed as a nationally unique resource for dune-based recreation opportunities. The BLM would continue to provide recreation opportunities for the public throughout the ISD SRMA by following the goals and objectives in the California Recreation and Visitor Services Strategy.

Management Actions Common to All Alternatives

- Provide a variety of sustainable OHV and other recreational activities.
- Develop, continue, and/or improve recreation monitoring to provide accurate and consistent data in order to make sound management decisions.
- Provide a quality recreational experience for OHV enthusiasts in the ISD SRMA.
- Manage the ISD SRMA as a regional or national destination through collaborative partnerships to promote the continued use of the lands for these activities.
- Manage the ISD SRMA as a nationally unique resource for dune-based recreation opportunities.
- Assure the conservation of recreation diversity to provide a spectrum of opportunities to meet the diverse tastes and preferences of the public.
- Provide for a wide range of quality recreation opportunities and experiences emphasizing dispersed undeveloped use.
- Encourage the use and enjoyment of desert recreation opportunities by special populations, and provide facilities to meet the needs of those groups.
- Collaborate with communities and constituencies to inventory and administer setting character to maintain a diversity of settings across the entire spectrum of recreation experiences, which include motorized uses such as motorcycling, four-wheeling, OHV recreation, and driving for pleasure; quiet recreation experiences such as hiking, horseback riding, and backpacking; and heritage tourism options that maintain the integrity of cultural, paleontological, and natural history and historical locations while interpreting the stories of these important places.

- Implement and monitor plan objectives to ensure that benefits, experiences, maintenance of recreation setting character, and land health standards are met.
- Continue to partner and collaborate with gateway communities and other partners to increase support, and strengthen economies for BLM recreational destinations.
- Identify opportunities for companies and community businesses to sponsor projects that achieve management objectives, maintain recreational character, and meet land health standards.
- Identify sustainable tourism opportunities and work with local communities, partners, historic interest groups, and the tourism community to sustain and promote education about, and enjoyment, and protection of those opportunities.
- Expand the adoption of recreation areas by partners and volunteers, by including them in the planning process as well as in implementing actions and assisting with ongoing maintenance.
- Continue to work closely with other agencies, local communities, and groups to support and promote the Watchable Wildlife program.

Primary Market Strategy

The primary market strategy for the potential ISD SRMA would be to target demonstrated destination recreation–tourism market demand for specific activity, experience, and benefit opportunities.

Partnerships and Coordination

BLM would coordinate with local and gateway communities, Native American tribes and groups, California SHPO, Imperial County, CDFG, USFWS, US Border Patrol (USBP), California State Parks, California State Lands Commission, local public health and safety organizations, other law enforcement entities, and various non-governmental organizations (NGOs).

Environmental Education Needs

BLM supports the *Tread Lightly!* and *Leave No Trace* national programs and promotes responsible OHV recreation, hunting ethics, and natural and cultural resource ethics. BLM would provide information about recreation, natural, cultural, and historical resources, and other points of interest.

2.3.14.3.2 Recreation Management Zones

Within each SRMA, BLM also allocates Recreation Management Zones (RMZ). An RMZ represents public lands with a distinctive recreation niche (activities, experiences, and benefits) within each SRMA. The BLM would focus management, funding, and planning within the SRMA and its RMZs to work towards stated Recreation Management Goals and Objectives.

The allocation of the SRMA and RMZs provides the Planning Area with an activity-level planning framework for recreation management. This DRAMP provides additional opportunities for public involvement and agency collaboration to further ensure that proposed actions are compatible with the BLM's multiple-use mission.

Recreation Management Zones are presented in Table 2-13 below. Maps 2-13 through 2-18 show RMZs by alternative. RMZs within the ISD SRMA had not previously been allocated, therefore Alternatives 1 and 2 do not have RMZ allocations in Table 2-13 below.

TABLE 2-13
RECREATION MANAGEMENT ZONES BY ALTERNATIVE (ACRES)

Recreation Management Zone (RMZ)	Alternatives							
	1	2	3	4	5	6	7	8
Open RMZ			74,676	105,843	103,839	108,914	125,710	127,416
Resource Protection RMZ			61,680	29,122	32,516	27,441	10,645	9,046
Limited RMZ			52,477	53,868	52,477	52,477	52,477	52,370
North Algodones Dunes Wilderness RMZ			26,098	26,098	26,098	26,098	26,098	26,098
Total			214,930	214,930	214,930	214,930	214,930	214,930

Note: Inconsistencies in acres may be due to GIS data and rounding.

Open RMZ

Goals and Objectives

Open RMZ would be managed for OHV and other motorized recreational opportunities while conserving natural and cultural resources.

Recreation Niche: The Open RMZ consists of two types of opportunities, camping and expansive sand dune OHV recreation. The camping areas are destination points off several roads and highways, including Interstate 8 (I-8), Ogilby Road (S34), and SR-78, that accommodate large, motorized camping units such as recreational vehicles (RVs), toy haulers, semi truck/trailer combinations, fifth wheel trailers, and others. The OHV

recreation area encompasses the large and small sand dunes where visitors operate their OHV for recreation.

Primary Activities: Camping and OHV recreation.

Experiences: OHV recreation, risk and challenge, camping (socializing with friends and family), watching OHV activity, commercial vending, reading, walking, and photography. Interactions between visitors may be high. Developed entry and access roads, intensified motorized recreation.

Benefits:

- Personal: Increased opportunities for visitors to appreciate open spaces through motorized and non-motorized recreation. Improves quality of life for visitors through health and fitness, stress reduction, and mental well-being. Promotes self-reliance and self-confidence through improved skills and knowledge. Enhanced sense of freedom, personal adventure, and appreciation of nature.

- Household & Community: Increased natural and historical appreciation from regional tourism. Increased opportunity for positive social interactions—including family bonding, OHV community, and stewardship of the public lands.

- Economic: Increased local and regional tourism. Increased local and regional tax revenue and employment opportunities.

- Environment: Reduced impacts to more sensitive natural and cultural resources by managing OHV recreation into areas identified by BLM.

Resource Protection RMZ

Goals and Objectives

The Resource Protection RMZ would be managed for its natural qualities to provide opportunities for expansive non-motorized recreational activities.

Recreation Niche: The Resource Protection RMZ would accommodate non-motorized recreation. Recreation may occur in the form of hiking, photography, and wildlife viewing. This RMZ provides the opportunity for environmental education through non-motorized exploration and observation of native plant and animal species.

Primary Activities: Hiking, wildlife viewing, photography.

Experiences: Hiking, wildlife viewing, and environmental education opportunities. Interactions between visitors may be low. No entry and access roads.

Benefits:

- Personal: Increased opportunities for visitors to appreciate open spaces through non-motorized recreation. Improves quality of life for visitors through health and fitness, stress reduction, and mental well-being. Promotes self-reliance, and self-confidence through improved skills and knowledge. Enhanced sense of freedom, personal adventure, and appreciation of nature.

- Household & Community: Increased natural and historical appreciation. Increased opportunity for positive social interactions, including family bonding and stewardship of the public lands.

- Economic: Increased regional tourism revenues.

- Environment: Reduced impacts to sensitive natural and cultural resources by reducing OHV recreation areas.

Limited RMZ

Goals and Objectives

The Limited RMZ would be managed for its limited motorized recreational opportunities and for natural qualities. There are three potential types of limited opportunities in the RMZ. The Limited RMZ is also managed under the NECO and WECO plans where OHV travel is permitted on designated routes.

Recreation Niche: The seasonal restriction Limited RMZ area can be accessed from I-8 to the Dunebuggy Flats camping area. The NECO and WECO Limited RMZ areas can be accessed from several points, including I-8, Ogilby Road, and SR-78. The area between the old and new Coachella canals can be accessed from I-8 and SR-78. These areas within the Limited RMZ provide the opportunity for environmental education through several interpretive kiosks in addition to offering camping and limited use OHV recreation.

Primary Activities: Camping and OHV recreation.

Experiences: Limited use OHV recreation (travel limited to designated routes of travel or areas with seasonal restrictions under specific conditions), camping, environmental education, and tourism opportunities. Interactions between users may be low. Developed entry and access roads, limited motorized use, commercial gravel pits, extensive sand dunes, and adjacent military bombing ranges.

Benefits:

- Personal: Increased opportunities for visitors to appreciate open spaces through limited motorized recreation. Improves quality of life for visitors through health and fitness, stress reduction, and mental well-being. Promotes self-reliance, and self-confidence through improved skills and knowledge. Enhanced sense of freedom, personal adventure, and appreciation of nature.

- Household & Community: Increased natural and historical appreciation from regional tourism. Increased opportunity for positive social interactions, including family bonding, OHV community, and stewardship of the public lands.

- Economic: Increased regional tourism.

- Environment: Reduced impacts to more sensitive natural and cultural resources by managing OHV recreation into areas identified by BLM.

North Algodones Dunes Wilderness RMZ

Goals and Objectives

The North Algodones Dunes Wilderness RMZ would be managed to sustain its wilderness characteristics and provide for non-motorized recreation opportunities.

Recreation Niche: The North Algodones Dunes Wilderness RMZ is an accessible destination point north of SR-78 that would accommodate non-motorized recreation. Recreational use may occur in the form of hiking and photography. This RMZ provides the opportunity for environmental education as well as informational kiosks, in addition to offering non-motorized recreation.

Primary Activities: Hiking, camping, photography.

Experiences: Camping, hiking, and environmental education opportunities. Interactions between users may be low. Developed entry and access roads, and scattered non-motorized recreational use.

Benefits:

- Personal: Increased opportunities for visitors to appreciate open spaces through non-motorized recreation. Improves quality of life for visitors through health and fitness, stress reduction, and mental well-being. Promotes self-reliance, and self-confidence through improved skills and knowledge. Enhanced sense of freedom, personal adventure, and appreciation of nature.

- Household & Community: Increased natural and historical appreciation. Increased opportunity for positive social interactions, including family bonding and stewardship of the public lands.
- Economic: Increased regional tourism revenues.
- Environment: Reduced impacts to sensitive natural and cultural resources within the WA.

Management Actions Common to All Alternatives

- Develop or retrofit facilities to accommodate visitation and meet agency requirements.
- Collect recreation fees.
- Conduct a visitor survey to provide public input on safety, natural and cultural resources concerns, and management of the Planning Area. Implement a visitor and OHV use survey.
- Work cooperatively with the OHV community, the environmental community, and other local, state, and federal agencies to develop and implement interpretive and public relations programs about issues and resources related to the Planning Area.
- Collect fees for commercial and non-commercial activities under the authority of the FLREA and other applicable regulations and BLM policy.
- Develop and maintain educational programs which may include on-the-ground improvements such as signs and interpretative kiosks, partnerships and educational materials, etc. throughout the Planning Area as funding allows.
- Consider utilization of concessionaire(s) to manage the ISD SRMA.
- Protect at-risk cultural and historical resources from recreational damage as needed throughout the Planning Area. Work together with new and existing groups to foster partnerships that accomplish BLM goals and objectives.
- Prohibit collection of wood for home heating purposes.
- Prohibit the burning of wood with non-combustible items (pallets).
- Maintain and/or develop volunteer campground host program in appropriate areas.
- Prohibit vending in all areas closed to OHV recreation, limited use areas, and the Mammoth Wash open area.

2.3.14.4 OHV Management Area Designations

This DRAMP/DEIS proposes to designate all BLM-administered public lands within the Planning Area as open, closed, or limited to motorized travel. OHV management areas by alternative are presented in Table 2-14 and Maps 2-19 through 2-26. Criteria and definitions for limited, open, and closed area designations are established in 43 CFR 8340.0-5 (f), (g), and (h), respectively. See Appendix F for a comparison by alternative and issue of recreation management actions.

TABLE 2-14
OHV MANAGEMENT AREA DESIGNATIONS BY ALTERNATIVE (ACRES[1])

Designation	Alternative							
	1	2	3	4	5	6	7	8
Open	120,393	87,713	74,676	105,843	103,839	108,914	125,710	127,416
Closed	26,098	75,322	87,778	55,220	58,614	53,539	36,743	35,144
Limited	68,440	51,896	52,477	53,868	52,477	52,477	52,477	52,370
Total Acres	214,930	214,930	214,930	214,930	214,930	214,930	214,930	214,930

[1] BLM-administered acres within the Planning Area.
Note: Inconsistencies in acres may be due to GIS data and rounding.

Open areas are areas where all types of vehicle use are permitted at all times, anywhere in the area.

Limited areas are restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following categories: numbers of vehicles, types and sizes of vehicles, time or season of vehicle use, permitted or licensed use only, use on existing roads and trails, use on designated roads and trails, limited to administrative use only, and other restrictions. In accordance with the CDCA Plan, as amended, stopping, parking, and vehicle camping is allowed within 300 feet of the centerline of a route, except within sensitive areas (such as ACECs) where the limit would be 100 feet. This would be monitored on a continuing basis. If monitoring results show effects that exceed limits of acceptable change, the distance allowed for motorized vehicles to pull off from a designated route may be modified. This plan would continue to be consistent with the CDCA Plan, as amended (NECO and WECO).

Closed areas are areas where motorized vehicle use is prohibited. Use of OHVs in closed areas may be allowed for administrative or emergency purposes; however, such use would be made only with the approval of the authorizing officer. Congressionally designated WAs are statutorily closed to motorized and mechanized use, except for purposes specifically provided for by law.

2.3.15 Transportation and Public Access

Public lands managed by the BLM in the Planning Area are intermingled with lands administered by other federal agencies, as well as county, state, and private lands. Managing access to and across public lands is a vital task for BLM. The authorities for the BLM to manage transportation and public access to and on the public lands include but are not limited to:

- FLPMA of 1976 (43 USC 1701 et seq.)
- ESA of 1973 (16 USC 1531 et seq.)
- Americans with Disabilities Act (ADA), 1990
- EO 11644
- EO 11989
- Title 5 ROWs
- RS 2477 (roads)
- *National Management Strategy Motorized Off-Highway Vehicle Use on Public Lands* (BLM 2001a)
- *National Mountain Bicycle Strategic Action Plan* (BLM 2002c)

The following proposed decisions concerning transportation and public access for the public lands within the Planning Area are:

- Designation of all BLM-administered lands within the Planning Area as open, closed, or limited to OHV use (and use plan-level decision).
- Designate routes of travel within the Planning Area as implementation-level decisions.

2.3.15.1 Routes of Travel

The routes of travel currently existing in the Planning Area were developed through the NECO (BLM 2002a) and WECO (BLM 2003a) plans. These routes of travel (Map 2-27) are therefore being brought forward as valid, existing implementation decisions and are common to all alternatives. See Chapter 3 (Affected Environment) Section 3.15—Transportation and Public Access, for further discussion of the existing routes of travel.

Routes of travel within the ISD ERMA have been designated as limited and routes within the ISD SRMA, excluding the WA, have been designated as open. Open routes are available to motorized vehicles. Limited routes may have additional limitations on use including vehicle size, vehicle type, and season of use. Closed routes would be closed to motorized vehicles, including OHV, but open to biking, hiking, and equestrian use. Table 2-15 provides the total mileage of open and limited routes in the Planning Area, and Map 2-27 illustrates the locations of the various routes of travel.

TABLE 2-15
ROUTES OF TRAVEL (MILES)

Route Name	Miles
Grays Well Road	4.49
Luis Aguilar Road	0.49
Wash Road	5.69
Gecko Road	6.39
Niland-Glamis Road	15.53
Ted Kipf Road	21.31
Other (unpaved)	174.31
Total Miles	228.21

2.3.15.1.1 Goals and Objectives

- Ensure that the BLM continues to provide essential motorized access to non-federal lands, prior existing rights on BLM lands, and private in-holdings surrounded by BLM lands.

- Ensure that the BLM continues to provide adequate motorized access for the maintenance of wildlife guzzlers and for dispersed recreation activities such as hunting.

- Ensure that the BLM provides for a wide variety of recreational opportunities (e.g., hiking, OHV recreation, horseback riding, filming, and commercial activities).

- Reduce or halt the unauthorized incursions into closed areas. Ensure that the BLM would minimize impacts to identified sensitive cultural, natural, biological, and visual resources.

2.3.15.1.2 Management Actions Common to All Alternatives

- Maintain, and where necessary, improve Wash Road.

- Allow primary vehicle travel only on routes designated for motorized vehicles. Emergency vehicles may utilize a drivable wash to access a site. Where no roads

exist, vehicles could be authorized on a case-by-case basis to travel cross-country to avoid the need for road building. Where new roads must be built, roadbeds would be no wider than needed for reliable access; BLM specifications would also be used to reduce erosion.

- Reduce vehicle incursions by restoring conditions of disturbed or degraded non-motorized routes or trespasses as rapidly as funding permits. Sensitive resources in immediate danger or those that have been damaged by linear disturbances would be a high priority for restoration. Typically, the restoration would be limited to that portion of the route of trespass that is in line of sight from an open route. Each route would be evaluated on a case-by-case basis, and the most appropriate method of restoration would be used based on geography, topography, soils, hydrology, and vegetation. The methods of restoration would include:
  - Not repairing washed-out routes
  - Using natural barriers, such as large boulders
  - Using rocks and dead and downed wood to obscure the route entryway
  - Employing mulching, chipping, and raking to disguise evidence of routes
  - Ripping up the route bed and reseeding with vegetation native to that area
  - Utilizing fences or barriers
  - Providing signage, including information to OHV users, on the need and value of resource protection
  - Converting motorized two-track routes into non-motorized single track routes
  - Ensure that designated routes within the Planning Area are adequately signed and mapped for public use.

2.3.16 Lands and Realty Management

The lands and realty management program consists of four distinct parts: land tenure, land use authorization (including solar and wind energy), withdrawals, and utility corridors. Land tenure focuses on disposing of and acquiring lands or interests in lands. Public lands would be retained in federal ownership, unless as a result of land use planning it is determined that disposal of a particular parcel would serve the national interest.

Land use authorization focuses on public demand requests for ROWs, permits, leases, and easements.

As used in the lands and realty program, a withdrawal removes an area of federal land from settlement, sale, location, or entry under some or all of the general land laws (including the Mining Law of 1872) for the purpose of limiting activities under those laws to maintain other public values in the area or reserving the area for a particular public purpose or program. Withdrawals are also used to transfer jurisdiction over an area of federal land from one department, bureau, or agency to another.

An energy corridor is a linear strip that has been identified through the land use planning process as being a preferred location for existing and future utility ROWs and that is suitable to accommodate one or more ROWs which are similar, identical, or compatible.

The lands and realty management program administers public lands within a framework of numerous laws and regulations. The most comprehensive of these is FLPMA which, along with implementing regulations, enables BLM to accomplish a variety of land actions, including but not limited to sales, withdrawals, acquisitions, exchanges, leases, permits, easements, and ROWs. In 1988, FLPMA was amended by the Federal Land Exchange Facilitation Act (FLEFA; 102 Stat. 1087), which established uniform rules and regulations for appraisals, procedures, and guidelines for the resolution of appraisal disputes in the exchange process.

Other applicable laws and policies include:

- Mineral Leasing Act (MLA) of 1920 (30 USC 185) as amended: BLM issues ROWs for oil and natural gas pipelines and related facilities pursuant to Section 28 of the MLA.

- Recreation and Public Purposes (R&PP) Act as amended: The act of June 14, 1926, as amended (43 USC 869 et seq.), is used primarily for providing land to fulfill the need for public services (parks, monuments, schools, community buildings, hospitals, sanitary landfills) due to urban expansion.

- Airport and Airway Improvement Act of 1982 (49 USC 2215): The act provides for the conveyance of BLM-administered lands to public agencies for use as airports and airways.

- Federal Highway Acts: Various federal highway acts codified in 23 USC, Sections 17 and 317 and the current Interagency Agreement also apply to lands and realty management.

- Federal Land Transaction and Facilitation Act (FLTFA [114 Stat. 613; 43 USC 2301 et seq.]) of July 25, 2000: The FLTFA amended FLPMA to allow retention by the BLM of receipts received from the sale of land or interests in land under Section 203 of FLPMA or conveyance of mineral interest under Section 209(b) of FLPMA, as long as the applicable land use plan was completed prior to July 25, 2000.

- The National Energy Policy Act of 2005 and EO 13423, dated January 24, 2007 provide direction to federal agencies to take appropriate actions to expedite the review of energy-related ROW projects, support renewable energy development on federal lands (including wind energy), and improve efficiencies in the processing of ROW applications.

A summary of potential lands and realty management actions by alternative is presented in Table 2-16.

2.3.16.1 Land Tenure

2.3.16.1.1 Disposal

All land disposal actions are discretionary with emphasis on the evaluation of whether such lands are: 1) manageable, 2) needed for any particular federal purpose, or 3) better suited to serving the public. Exchanges are used for disposal to assure an optimum final land ownership pattern and provide better overall land management. Sales would be considered where more efficient. Sales are primarily competitive or modified competitive. Disposal of these lands would be made on a case-by-case basis and would be accomplished by the most appropriate disposal authority.

Public lands have potential for disposal when they are isolated and/or difficult to manage and do not contain legally protected species of plants or animals or cultural artifacts or affect Native American cultural values. Exceptions to these criteria could occur, such as disposal to a non-federal governmental agency or private organization better qualified to ensure the protection of the sensitive species, habitat, or resources. Disposal actions are usually in response to a public request or application. BLM could dispose of withdrawn lands with the concurrence of the withdrawing agency.

There are two distinct disposal methods outlined in FLPMA, sale and exchange.

- Land disposal by public sale is addressed in Section 203 of FLPMA. This section contains three criteria to apply in identifying public lands suitable for disposal by public sale. The criteria are that: a) the tract of public land is difficult and uneconomical to manage as part of the public lands and is not suitable for management by another federal department or agency, b) the land is no longer required for a specific purpose, or c) disposal would serve important public objectives.

TABLE 2-16
LANDS AND REALTY ACTIONS BY ALTERNATIVE

Lands Actions	Alternative							
	1	2	3	4	5	6	7	8
Land Tenure								
Disposal (acres)	0	0	0	0	0	0	0	0
Acquisitions (acres)	Currently pending land acquisitions equal 6,603 acres under all alternatives.							
Acquisitions	Lands and interests in lands (including easements) would be acquired from willing sellers on a case-by-case basis. Land exchange proposals may also be considered on a case-by-case basis. Emphasis would be on protecting sensitive biological and archaeological resources; facilitating public recreation programs; and consolidating the WA.							
Land Use Authorizations								
Leases, Permits, and Easements	Considered and authorized on a case-by-case basis to meet public demand consistent with exclusion and avoidance areas[1] identified by alternative.							
Allow apiary permits on a case-by-case basis within strategically located sites to limit interaction with the public.	X			X	X	X	X	X
Prohibit apiary permits in the Planning Area.		X	X					
ROWs	Considered and authorized on a case-by-case basis to meet public demand consistent with exclusion and avoidance areas identified by alternative.							
Communication Sites (number)	4				Considered and authorized on a case-by-case basis to meet public demand consistent with exclusion and avoidance areas identified by alternative.			
Renewable (solar and wind) Energy[1]	Considered and authorized on a case-by-case basis to meet public demand consistent with exclusion and avoidance areas identified by alternative.							
The WA is withdrawn from all forms of land entry.	X	X	X	X	X	X	X	X

TABLE 2-16
LANDS AND REALTY ACTIONS BY ALTERNATIVE (CONT.)

Lands Actions	Alternative							
	1	2	3	4	5	6	7	8
Land Use Authorizations (cont.)								
ACEC(s) would be exclusion areas for solar energy development.[2]			X					X
ACECs would be exclusion areas for wind energy development.			X					X
ACECs would be avoidance areas for solar energy development.		X		X	X	X		
ACECs would be avoidance areas for wind energy development.		X		X	X	X		
ACECs would be available for solar energy development.							X	
ACECs would be available for wind energy development.							X	
ACECs would be avoidance areas for all land use authorizations other than for solar and wind development.				X	X	X		
Flat-tailed horned lizard management area would be an exclusion area for solar energy development.			X					X
Flat-tailed horned lizard management area would be an exclusion area for wind energy development.			X					X

TABLE 2-16
LANDS AND REALTY ACTIONS BY ALTERNATIVE (CONT.)

Lands Actions	Alternative							
	1	2	3	4	5	6	7	8
Land Use Authorizations (cont.)								
Flat-tailed horned lizard management area would be an avoidance area for solar energy development.		X		X	X	X		
Flat-tailed horned lizard management area would be avoidance area for wind energy development.		X		X	X	X		
Flat-tailed horned lizard management area would be available for solar energy development.							X	
Flat-tailed horned lizard management area would be available for wind energy development.							X	
PMV critical habitat would be an exclusion area solar energy development.			X					X
PMV critical habitat would be an exclusion area for wind energy development.			X					X
PMV critical habitat would be an exclusion area for all other types of land use authorization.			X					X

TABLE 2-16
LANDS AND REALTY ACTIONS BY ALTERNATIVE (CONT.)

Lands Actions	Alternative							
	1	2	3	4	5	6	7	8
Land Use Authorizations (cont.)								
PMV critical habitat would be an avoidance area for solar energy development.		X		X	X	X		
PMV critical habitat would be an avoidance area for wind development.		X		X	X	X		
PMV critical habitat would be an avoidance area for all other types of land use authorization.		X		X	X	X		
PMV critical habitat would be available area for solar development.							X	
PMV critical habitat would be available area for wind development.							X	
PMV critical habitat would be available for all other types of land use authorization.							X	
MUC I (intensive) lands would be an exclusion area for solar energy development.			X					
MUC I (intensive) lands would be an exclusion area for wind energy development.			X					

TABLE 2-16
LANDS AND REALTY ACTIONS BY ALTERNATIVE (CONT.)

Lands Actions	Alternative							
	1	2	3	4	5	6	7	8
Land Use Authorizations (cont.)								
MUC I (intensive) lands would be an avoidance area for solar energy development.		X		X	X	X		
MUC I (intensive) lands would be an avoidance area for wind energy development.		X		X	X	X		
MUC L (limited) lands would be an exclusion area for solar energy development.			X					
MUC L (limited) lands would be an exclusion area for wind energy development.			X					
MUC L (limited) lands would be an avoidance area for solar energy development.		X		X	X	X		
MUC L (limited) lands would be an avoidance area for wind energy development.		X		X	X	X		
Donated lands would be an exclusion area for solar energy development.			X					X
Donated lands would be an exclusion area for wind energy development.			X					X

TABLE 2-16
LANDS AND REALTY ACTIONS BY ALTERNATIVE (CONT.)

Lands Actions	Alternative							
	1	2	3	4	5	6	7	8
Land Use Authorizations (cont.)								
Donated lands would be an avoidance area for solar energy development.		X		X	X	X		
Donated lands would be an avoidance area for wind energy development.		X		X	X	X		
Donated lands would be available for solar energy development.							X	
Donated lands would be available for wind energy development.							X	
Entire Planning Area would be available for solar energy development (with exception of WA)	X	X					X	
Entire Planning Area would be available for wind energy development (with exception of WA)	X	X					X	
Withdrawals (acres)								
Existing Withdrawal–WA	26,098	26,098	26,098	26,098	26,098	26,098	26,098	26,098
Utility Corridors (number)[3]	3	3	3	3	3	3	3	3

[1] Geothermal development is regulated by the land use decisions presented under leasables in the Mineral Resources section.
[2] Avoidance area is defined as an area only available for discretionary land-use authorizations when there are no other reasonable alternatives for the authorization. Exclusion area is defined as an area that is not available for discretionary land use authorizations.
[3] The contingency corridor travels along the eastern boundary of the Planning Area adjacent to the UPRR tracks.

- The criteria for determining which public lands or interests therein are available for disposal by exchange are covered in Section 206 of FLPMA. These criteria require BLM to consider the public interest by giving full consideration to better federal land management and the needs of state and local people. These include the need of lands for the economy, community expansion, recreation areas, food fiber, minerals, and fish and wildlife. The criteria also require that the public objectives to be served must be greater on the lands to be acquired than on the lands to be conveyed.

The BLM may also dispose of lands under the following four authorities:

- **Desert Land Entry Act of 1877**. No lands have been identified as meeting the criteria for entry under this authority; therefore, none are available for disposal under this authority.

- **Indian Allotment Act of 1887.** No lands have been identified as meeting the criteria for entry under this authority; therefore, none are available for disposal under this authority.

- **The 1954 Revision of the Act of June 14, 1926 (R&PP) Act.** This authorizes the lease and/or conveyance of BLM-administered lands for recreational or public purposes to state and local governments and to qualified nonprofit organizations under specified conditions at less than the fair market value.

- **The Airport and Airway Improvement Act of 1982.** This act provides for the conveyance of BLM-administered lands to public agencies for use as airport and airways.

In general, under all land ownership adjustments, BLM would protect valid existing rights and pre-existing authorizations including but not limited to authorized permits, leases, and ROWs.

Land Available for Disposal by Alternative

No lands would be available for disposal within the Planning Area under all Alternatives.

2.3.16.1.2 Acquisition

Purchase and donations of lands are a key mechanism for land acquisition. Lands or interest in lands (including easements) may be acquired by BLM through purchase, exchange, or donation. Section 205 of FLPMA authorizes the Secretary of the Interior (delegated to BLM) to acquire non-federal lands or interests in lands pursuant to FLPMA by purchase, exchange, or donation.

Currently, the BLM is actively acquiring flat-tailed horned lizard habitat as mitigation for impacts to lost habitat resulting from several projects, including the Arizona State

Highway project, Drop 2 Water Reservoir, and the All-American Canal lining. Compensation monies are being used to make the purchases of lands from willing sellers. Sections of land, or portions thereof, in various stages of the acquisition process lie within the Planning Area.

Goals and Objectives

Lands or interest in lands (including easements) to be acquired must either:

- Facilitate access to public lands and resources
- Maintain or enhance public uses and values
- Facilitate implementation of this DRAMP/DEIS
- Provide for a more manageable land ownership pattern
- Include significant natural or cultural resource values

Management Actions Common to All Alternatives

- Manage all acquired lands in accordance with the approved land use and planning decisions for surrounding or adjacent BLM-administered lands.
- Consolidate split-estate pursuant to Sections 205 and 206 of FLPMA.
- Any lands acquired by the BLM would include both the surface and subsurface (minerals) estate when possible and would be managed in accordance with the approved land use decisions for the surrounding area.

2.3.16.2 Land Use Authorizations

2.3.16.2.1 Leases/Permits/Easements

The ECFO would strive to increase and diversify our nation's sources of both traditional and alternative energy resources, improve our energy transportation network, and ensure sound environmental management in accordance with the President's National Energy Policy. Section 302 of FLPMA gives the Secretary of the Interior broad authority to manage public lands "through easements, permits, leases, licenses, published rules, or other instruments."

Leases, permits, or easements would be considered and issued under applicable laws and regulations pursuant to regulations found at 43 CFR 2900. Issuance of leases, permits, or easements is a discretionary action. These authorizations may include but are not limited to the following:

- Airport leases
- R&PP Act leases
- 2920 Leases, permits, or easements (e.g., film permits, apiary permits)

Public land is subject to application for community expansion needs under a wide variety of public land laws. Community expansion needs would continue to be handled on a case-by-case basis in accordance with the appropriate authority. BLM would utilize federal lands for community expansion needs such as airports, parks, hospitals, and community centers pursuant to applicable laws and regulations.

An easement is defined as the right to use another person's real estate for a specific purpose. The most common type of easement is the right to travel over another person's land, known as a ROW. In addition, property owners commonly grant easements for the placement of utility poles, utility trenches, water lines, or sewer lines. The owner of property that is subject to an easement is said to be "burdened" with the easement, because he or she is not allowed to interfere with its use.

Goals and Objectives

- Manage recreational and commercial activities within the Planning Area to accommodate visitor needs, improve visitor experience, and—where consistent with management goals—allow economic benefits for local and regional communities.
- Maintain public access to BLM-administered lands through easements when needed.
- Be responsive to public demand for leases, permits, and easements on a case-by-case basis, consistent with management prescriptions in Table 2-16.
- Land would not be available for leasing for residential purposes.

Management Actions Common to All Alternatives

- Consider leases, permits, and easements on a case-by-case basis.

2.3.16.2.2 Rights-of-way

Under the authorities of FLPMA (1976) and the MLA of 1920, BLM grants ROWs to qualified individuals, businesses, and government entities for use of public lands.

Title V of FLPMA, as amended, states that BLM is authorized to grant, issue, or renew ROWs over, upon, under, or through lands for various uses. The uses that would be authorized by ROW grants issued pursuant to FLPMA would include access roads, power lines, telephone lines, fiber-optic systems, communications facilities, and water and sewer pipelines.

BLM may also allow the use of the public lands or interests in lands through issuance of ROWs pursuant to MLA. Examples of uses that would be authorized by ROW grants issued pursuant to the MLA would include crude oil pipelines and oil and gas pipelines.

Goals and Objectives

Be responsive to public demand for ROWs on a case-by-case basis, consistent with management prescriptions in Table 2-16.

Management Actions Common to All Alternatives

- Locate new major ROWs in designated corridors (reference Section 2.3.16.4—Utility Corridors, below, for the definition of the designated corridors), unless an evaluation of the project shows that locating outside of a designated corridor is the only practicable alternative.

2.3.16.2.3 Communication Sites

Communication sites are generally limited by the BLM to designated mountain peaks with existing facilities. Emphasis would be placed on consolidating single facility sites into more efficient communication facilities through site development plans.

Public lands may also be designated for use as a communications site. BLM communications sites accommodate the wireless systems referred to in the Telecommunications Act of 1996 as well as many other uses, including radio broadcast facilities, commercial mobile radios, private mobile radios, and microwaves on designated communications sites located on mountaintops.

There are four existing communication sites in the Planning Area:

- Cahuilla Ranger Station Communication Site
- Osborne Overlook Communication Site
- Dunes Vista Communication Site
- Dunebuggy Flats Communication Site

See Map 2-28 for the locations of existing communication sites.

Goals and Objectives

When practicable, consolidate future proposed facilities within existing communication sites, consistent with management proscriptions in Table 2-16.

Management Actions Common to All Alternatives

- Ensure any application for proposed facilities at existing communication sites is compatible with other uses at the site existing at the time of application.

- Consider applications for new communication sites outside the four existing sites on a case-by-case basis emphasizing co-location and subleasing of facilities, consistent with management proscriptions shown in Table 2-16 above.

2.3.16.2.4 Renewable Energy (Solar and Wind)

This section addresses renewable energy development not discussed in the Minerals section. The potential for renewable (solar and wind) energy in the Planning Area is based on environmental, physical, and economic criteria, in conjunction with policy directives. BLM's general policy is to facilitate environmentally responsible commercial development of solar-energy projects on public lands and use solar energy systems on BLM facilities where feasible.

Statutes and regulations applicable to wind energy development on public lands in the Planning Area include FLPMA and 43 CFR 2800. As stated in EO 13212, an energy project streamlining process requires expediting production, transportation, and conservation of energy.

Wind-energy projects would comply with Instruction Memorandum 2009-043 Wind Energy Development Policy, Attachment A in the Wind Energy Development Program ROD (BLM 2005c), and the FPEIS on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2005b) is tiered to and thereby incorporated by reference.

BLM would strive to increase and diversify our nation's sources of both traditional and alternative energy resources, improve our energy transportation network, and ensure sound environmental management in accordance with the President's National Energy Policy (National Energy Policy Development Group 2001).

Regulations applicable to solar arrays on public lands in the Planning Area include FLPMA, 43 CFR 2800, Instruction Memorandum 2007-097 Solar Energy Development Policy, or subsequent BLM policy for solar energy.

Additionally, DOD entities in the State of California requested that the BLM provide them with early notification of proposed renewable energy development on public lands. The objective of this early coordination is to provide an opportunity for the DOD to coordinate and consult with the BLM to inform BLM of DOD's concerns with the proposed renewable energy development project as it may relate to current and future military training missions including: military operating areas, military training routes, air space, and ground access.

For proposed renewable energy development, it is critical that this notification and coordination occur at the earliest possible stage, e.g., when permits for wind testing are being considered by BLM. This can help identify proposed wind energy projects which may impact current and future military operations before an applicant invests large amounts of money or time in a project. Early involvement by the military would alert an applicant when a project may be a concern to military operations and mission. It would also help to identify changes in a proposed project and/or mitigation which would minimize impacts to current and future military operations. Changes may include reducing the number of wind turbines proposed for the area or relocating proposed individual wind turbines or solar power towers to minimize interference with military training routes.

Goals and Objectives

Provide for the production and distribution of renewable energy, consistent with management of the recreation area and prescriptions in Table 2-16 above.

Management Actions Common to All Alternatives

- Make land available for renewable energy development consistent with applicable laws, regulations, and policy and in accordance with the approved land use and planning decisions.

- Use BLM Wind Energy Development Program Policies and BMP established in Attachment A of the ROD (BLM 2005c) for all site-specific wind development projects. This policy would also be used as guidance for other renewable (e.g., solar) development projects, until such time as specific program guidance is developed.

Management Actions by Alternative

Lands available (acres) for solar and wind energy development by alternative are described in Tables 2-17 through 2-18 and in Maps 2-29 through 2-36. Table 2-11 above provides the acreages of lands available for potential geothermal minerals leasing by alternatives. See Appendix F for a comparison by alternative of lands available for geothermal, solar, and wind energy development.

TABLE 2-17
LAND AVAILABLE FOR SOLAR ENERGY DEVELOPMENT BY ALTERNATIVE (ACRES)

	Alternative							
	1	2	3	4	5	6	7	8
Available	188,832	188,832	47,131	39,694	39,694	39,694	188,832	35,115
Avoidance	0	0	0	144,290	144,290	144,290	0	0
Excluded	0	0	141,702	4,847	4,847	4,847	0	153,717
Total	188,832	188,832	188,832	188,832	188,832	188,832	188,832	188,832

Note: Inconsistencies in acres may be due to GIS data and rounding.

TABLE 2-18
LAND AVAILABLE FOR WIND ENERGY DEVELOPMENT BY ALTERNATIVE (ACRES)

	Alternative							
	1	2	3	4	5	6	7	8
Available	188,832	188,832	47,131	39,694	39,694	39,694	188,832	35,115
Avoidance	0	0	0	144,290	144,290	144,290	0	0
Excluded	0	0	141,702	4,847	4,847	4,847	0	153,717
Total	188,832	188,832	188,832	188,832	188,832	188,832	188,832	188,832

Note: Inconsistencies in acres may be due to GIS data and rounding.

2.3.16.3 Withdrawals

A withdrawal removes an area of federal land from settlement, sale, location, or entry under some or all of the general land laws, for the purpose of limiting activities under those laws to maintain other public values in the area or reserving the area for a particular public purpose or program. Withdrawals are also used to transfer jurisdiction over an area of federal land from one department, bureau, or agency to another.

2.3.16.3.1 Land Withdrawn, Current and Proposed

Goals and Objectives

Protect sensitive or significant natural and cultural resource and/or recreational values from disturbances relating to locatable mineral entry.

Management Actions

- Seek revocation of existing withdrawal, if the land is no longer needed for the original purpose of the withdrawal.
- Continue periodic review of existing withdrawals, including other agency withdrawals, to ensure that the reasons for the withdrawal are still valid and that only the acreage needed is retained in withdrawn status.

2.3.16.4 Utility Corridors

To minimize adverse environmental impacts and the proliferation of separate ROWs, the utilization of utility corridors would be required to the extent practical and each ROW would reserve to BLM the right to grant additional ROWs or permits for compatible uses on or adjacent to ROWs granted pursuant to FLPMA. In designating utility corridors and in determining whether to require that ROWs be confined to them, BLM would take into consideration national and state land-use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices.

2.3.16.4.1 Goals and Objectives

- Consolidation of major ROWs within the approved corridor to minimize resource impacts.
- The designated corridors would be the preferred location for major utility ROWs consistent with the CDCA Plan, as amended.

2.3.16.4.2 Management Actions Common to All Alternatives

- Continue the existing three utility corridors (one is a contingency corridor). There is one 2-mile-wide existing utility corridor along I-8 on BLM-administered lands within the Planning Area. A second utility corridor begins in the northernmost portion of the Planning Area near Mammoth Wash and runs north (see Map 2-28). The contingency corridor travels along the eastern boundary of the Planning Area adjacent to the UPRR tracks (Map 2-28).
- Locate all new major utility ROWs (consisting of the following types) within the designated corridors: 1) new electrical transmission towers and cables of 161 kilovolts (kV) or above; 2) all pipelines with diameters greater than 12 inches; 3) coaxial cables for interstate communications; and (4) major aqueducts or canals for interbasin transfers of water.
- Avoid special designation areas and environmentally sensitive areas, where practical.

2.3.17 Public Health and Safety

According to applicable federal and state laws and regulations, BLM would identify areas or hazards which have a potential impact to public health and safety.

The following are public health and safety concerns in the Planning Area:

- Human health and safety and law enforcement

- International border issues
- Unexploded ordnance (UXO)
- Hazardous materials
- Noise

2.3.17.1 Human Health and Safety and Law Enforcement

Federal regulation Title 43 CFR Part 8340.0-2 directs BLM to protect the resources of public lands, to promote the safety of all users of those lands, and to minimize conflicts among the various users of those lands. Both the BLM and visitors to the Planning Area are concerned about compliance with laws and regulations and current law enforcement issues. Increasing visitor populations during the OHV-recreation season create large crowds and congestion throughout the Planning Area. During the high visitation holiday periods, there is a need to increase the level of enforcement to maintain the quality of the recreational experience currently enjoyed by the majority of the visiting public. The BLM will continue to promote public health and safety throughout the Planning Area.

2.3.17.1.1 Goals and Objectives

- Work cooperatively with the county, the contracted emergency medical service providers, and other interested agencies, to find innovative methods of providing the highest level of emergency medical service needed to adequately serve visitors to the Planning Area, as needs fluctuate.
- Provide adequate basic life support training to the ISD SRMA staff as a minimum level of emergency medical service.
- Improve the health and safety of visitors, employees, and nearby residents by working with local, state, and federal agencies and interest groups.
- Promote safety through education about the rules and regulations within the Planning Area.
- Promote safety through law enforcement activities to improve compliance with the rules and regulations of the Planning Area.
- Improve health by addressing the air quality around established roads with the management of dust and particulates through stabilization and/or reduction in accumulation, as appropriate and practical, and the enforcement of speed limitations.
- Provide education to encourage compliance with the rules about camping-related issues such as disposal of trash and wastewater.

- Reduce OHV-related accidents and injuries. Provide education concerning the rules and regulations relating to OHV use within the Planning Area.
- Increase compliance with all laws and regulations.
- Strive to minimize, within the scope of its authority, excessive noise.
- Maintain or improve noise levels in the Planning Area.

2.3.17.1.2 Management Actions Common to All Alternatives

- Work cooperatively with the county, contracted emergency medical service providers, and other partners to find innovative methods of providing the highest level of emergency medical service needed to adequately serve the visitors of the Planning Area, as needs fluctuate.
- Provide emergency medical technician training to the permanent visitor services staff as a minimum level of emergency medical service.
- Provide adequate off-highway emergency medical service support to the county and visitors throughout the Planning Area.
- Maintain and enhance cooperation between law enforcement entities having jurisdictional authority within the Planning Area. Enforce existing rules and regulations to facilitate a safe visitor experience. Manage OHV destination areas to provide safety for the OHV recreationists and agency personnel.
- Provide for adequate law enforcement and visitor services (emergency medical technicians).
- Maintain law enforcement coalition.

2.3.17.2 International Border Issues

BLM manages approximately 11 miles of public land along the US-Mexico border within the Planning Area. Along the US-Mexico border there are incidences of undocumented immigrant traffic and other criminal activity.

2.3.17.2.1 Goals and Objectives

Ensure that public lands adjacent to the US-Mexico border are safe for public and agency use.

2.3.17.2.2 Management Actions Common to All Alternatives

- Coordinate with USBP to minimize impacts to resources in emergency situations, where greater access may be required.
- Educate visitors about border safety through continued partnerships.

2.3.17.2.3 Management Actions by Alternative

US-Mexico border area access by alternative is described in Table 2-19 below.

TABLE 2-19
US–MEXICO BORDER ACCESS BY ALTERNATIVE

Management Actions	Alternative							
	1	2	3	4	5	6	7	8
Maintain area adjacent to the US–Mexico border as open to public use and continue voluntary compliance through public education and cooperation with USBP to enhance public safety.	X	X					X	X
Prohibit public use of the area within 100 feet of the US–Mexico border.			X					
Prohibit public use of the Roosevelt Reservation area (60 feet) adjacent to the US–Mexico border.				X	X	X		

2.3.17.3 Unexploded Ordnance

UXO consists of military materials used in tests and on training ranges. UXO may include but is not limited to bombs, mortars, artillery shells, rockets, submunitions, and landmines.

Two sources of risk exist at UXO sites: 1) risks from explosions and 2) risks from munition constituents (materials originating from UXO or other munitions, including the chemical constituents that result from their breakdown) that have leached into soil and water.

The US Army Corps of Engineers (USACE) is responsible for investigating and mitigating environmental impacts related to past military use at these types of facilities.

Given the number of aircraft used on the various military facilities in the vicinity of the Planning Area, it is possible that a military aircraft could crash or miss targets in the live ranges and be a source of UXO.

2.3.17.3.1 Goals and Objectives

Promote public and/or environmental safety from UXO and related hazardous materials.

2.3.17.3.2 Management Actions Common to All Alternatives

- Identify the locations on BLM-administered lands that are potential areas of UXO concern in cooperation with the USACE.
- Report UXO to the proper authorities for disposal as they are found.

2.3.17.4 Hazardous Materials

Hazardous materials consist of chemicals and materials that have the potential to adversely impact human health and the environment. In the Planning Area, hazardous materials could include but are not limited to petroleum products, industrial chemicals, acids, heavy metals, lead-based paint, and asbestos-containing materials. Potential sources of hazardous materials include abandoned mines, mining mill sites, landfills, illegal dumping (including sewage), leaking fuel tanks, illegal drug manufacturing sites, abandoned buildings, and other sites.

Illegal dumping has a potential to cause environmental impacts to BLM-administered land within the Planning Area. Chemical leachate from these sites has the potential to contaminate soil and reach surface and/or groundwater.

Laws governing the management of these materials include Comprehensive Environmental Recovery, Compensation and Liability Act (CERCLA), the Resource Conservation Recovery Act (RCRA), other federal laws and regulations, and state and local regulations. Mining and milling wastes are managed under CERCLA as potentially hazardous materials or hazardous waste.

2.3.17.4.1 Goals and Objectives

Minimize the presence and potential impact to human health and the environment from hazardous materials.

2.3.17.4.2 Management Actions Common to All Alternatives

- Perform public notification of potential health risks by means of notices, signage, and other forms of communication.
- Remediate areas contaminated with hazardous materials in accordance with applicable laws and regulations.

2.4 Comparison of Impacts by Alternative

Table 2-20, beginning on the following page, provides a summary of the impacts that would occur from implementing the No Action and seven action alternatives. Chapter 4 provides a more detailed analysis of impacts.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Air Quality								
OHV Management Area Designations	Emissions generated in the Planning Area would be greater than the baseline condition for Alternative 1.	Emissions generated in the Planning Area would be unchanged for Alternative 2.	Emissions generated in the Planning Area would be less than the baseline condition under Alternative 3. There would be the potential for campgrounds in the Dunebuggy Flats and Gecko areas to be closed.	Same as Alternative 1.				Same as Alternative 1. The Dunebuggy Flats Campground would be closed if the rainfall threshold for PMV is met. Such campground closures may result in increased camping in other areas in the vicinity such as Ogilby and Dunes Vista. The Dunes Vista camping area is a significant distance from the actual sand dunes and could generate more dust from OHVs traveling from the camp to the dunes. Riding in the valley floor areas generates more dust than riding on the dunes.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Soil Resources								
Geothermal Leasing	Under Alternatives 1 and 2, 188,426 acres would be available for geothermal leasing, resulting in greater potential impacts to soil resources. Under these alternatives, there would be increased acreages of lost soil productivity within the Planning Area (see Table 4-1).		Geothermal leasing would impact the least amount of soil resources under Alternatives 3 and 4. Under Alternative 3, no acres within the planning area would be available for geothermal leasing and under Alternative 4, 188,426 acres would be available but with a No Surface Occupancy stipulation.		Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing, resulting in low to moderate potential impacts to soil resources as compared to Alternatives 1, 2, and 7.		Same as Alternatives 1 and 2.	Under Alternative 8, moderate impacts to soil resource would likely occur as 35,115 acres would be available for geothermal leasing.
OHV Management Area Designations	Under Alternative 1, there would be increased acreages open to OHV recreation resulting in the most acres of potentially lost soil productivity within the Planning Area (see Table 4-1).	OHV area designations would impact soils the least under Alternatives 2 and 3. Under these alternatives, the fewest number of acres open to OHV recreation (87,713 and 74,676 respectively) and highest number of closed acres (75,322 and 87,778 respectively) occur. Motorized travel would not be authorized within proposed closed OHV management areas, and additional soil erosion and compaction from OHV recreation would no longer occur.		Under Alternatives 4, 5, and 6, impacts to soil resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8.			Same as Alternative 1.	

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Soil Resources (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind development would increase (188,833 acres available) and, in turn, potential impacts to soil resources would be greater. Under these alternatives, there would be increased acreages of lost soil productivity within the Planning Area (see Table 4-1).		Impacts to soil resources from solar and wind development would the lowest under Alternative 3 and 8. Under this alternative 47,131 acres within the Planning Area would be available for solar and wind development.	Under Alternatives 4, 5, and 6, impacts to soil resources would be greater than under Alternatives 3 and 8 as these alternatives propose 39,694 acres available and 144,290 acres as avoidance for solar and wind development.(Only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization.)			Same as Alternatives 1 and 2.	Impacts to soil resources from solar and wind development would the lowest under Alternative 3 and 8. Under this alternative 35,115 acres within the Planning Area would be available for solar and wind development.
Water Resources								
	Differences in impacts to ground water resources would potentially vary by alternative as the amount of surface disturbance varies. Alternatives providing more acreage for OHV recreation, camping, construction activities, as well as renewable energy and geothermal leasing activities would result in greater impacts (see Table 4-1). Differences in impacts to ground water resources by alternative would be similar to those outlined in Section 4.3.2 for Soil Resources above.							

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Vegetative Resources								
Geothermal Leasing	Under Alternatives 1 and 2, lands available for geothermal development would be the greatest (188,426 acres) and, in turn, potential impacts to vegetation resources would be greater. Under these alternatives, there would be increased potential for the loss of vegetative resources due to geothermal construction and development activities within the Planning Area (see Table 4-1).		Geothermal development would impact the fewest acres, and therefore vegetation resources, under Alternatives 3 and 4 (see Table 4-1).		Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing. Moderate impacts to vegetation resources would occur as compared to Alternatives 3 and 4		Same as Alternatives 1 and 2.	Under Alternative 8, 35,115 acres would be available for geothermal leasing. Moderate impacts to vegetation resources would occur as compared to Alternatives 3 and 4
OHV Management Area Designations	Under Alternative 1, there would be increased acreages open to OHV recreation resulting in an increased number of acres of potentially lost or disturbed vegetation within the Planning Area (Table 4-5).	OHV management area designations would impact vegetation resources, including priority plant species, the least under Alternatives 2 and 3 (Table 4-3). The greatest number of acres closed or limited to OHV recreation is found under these alternatives. Motorized travel would not be authorized within proposed closed OHV management areas, and vegetative loss from OHV recreation would no longer occur.		Under Alternatives 4, 5, and 6, impacts to vegetation resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8.			Same as Alternative 1.	

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Vegetative Resources (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind leasing would increase and, in turn, potential impacts to vegetation resources would be greater. Under these alternatives, there would be increased acreages of construction and development for solar and wind sites within the Planning Area (see Table 4-1).		Impacts to vegetation resources, including priority plant species, from solar and wind leasing would be lowest under Alternative 3.	Under Alternatives 4, 5, and 6, impacts to vegetation resources would be greater than under Alternatives 3 and 8 but less than under Alternatives 1, 2, and 7. Under Alternatives 4, 5, and 6 there would be 144,290 acres of land designated as avoidance areas.			Same as Alternatives 1 and 2.	Same as Alternative 3.
Wildlife Resources								
Geothermal Leasing	Under Alternatives 1 and 2, lands available for geothermal development would increase and, in turn, potential impacts to wildlife resources would be greater. Under these alternatives, there would be increased potential for the loss of habitat, disturbance of species communities, and direct mortality due to geothermal construction and development activities within the Planning Area (see Table 4-1).		Geothermal development would impact the least amount of acres under Alternatives 3 and 4.		Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing. moderate impacts to vegetation resources would occur as compared to Alternatives 3 and 4. Moderate impacts to wildlife resources would occur as compared to Alternatives 3 and 4.		Same as Alternatives 1 and 2.	Under Alternative 8, 35,115 acres would be available for geothermal leasing. Moderate impacts to wildlife resources would occur as compared to Alternatives 3 and 4.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Wildlife Resources (cont.)								
OHV Management Area Designations	Under Alternative 1, there would be increased acreages open to OHV recreation resulting in an increased number of acres of habitat potentially lost or disturbed within the Planning Area (see Table 4-1).	OHV area designations would impact wildlife resources, including priority species, the least under Alternatives 2 and 3 (see Table 4-1). The greatest number of acres closed or limited to OHV recreation is found under these alternatives. Motorized travel would not be authorized within proposed closed OHV management areas, and loss of habitat, disturbance of species communities, and direct mortality from OHV recreation would no longer occur.		Under Alternatives 4, 5, and 6, impacts to wildlife resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8.			Same as Alternative 1.	
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind development would increase and, in turn, potential impacts to wildlife resources would be greater. Under these alternatives, there would be increased acreages of construction and development for solar and wind sites within the Planning Area (see Table 4-1).		Impacts to wildlife resources, including priority species, from solar and wind development would the lowest under Alternative 3.	Under Alternatives 4, 5, and 6, impacts to wildlife resources would be greater than under Alternatives 3 and 8 but less than under Alternatives 1, 2, and 7. Under Alternatives 4, 5, and 6 there would be 144,290 acres of land designated as avoidance areas.			Same as Alternatives 1 and 2.	Same as Alternative 3.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Special Status Species: Peirson's milk-vetch								
Geothermal Leasing	Geothermal leasing would have the greatest impacts to PMV under Alternatives 1 and 2. Under these alternatives, 188,426 acres (88 percent) of the Planning Area, except the North Algodones Dunes Wilderness, would be available for geothermal leasing and surface occupancy (see Table 4-1 and Map 2-7). Under these alternatives, PMV critical habitat would not be excluded from geothermal energy development surface occupancy.		No geothermal leasing would be allowed within the Planning Area (Table 4-1, Map 2-9). Under this alternative, PMV critical habitat would not be impacted by geothermal development.	Under Alternative 3, no geothermal leasing would be allowed within the Planning Area (see Table 4-1 and Map 2-8). Under this alternative, PMV critical habitat would not be impacted by geothermal development.	Under Alternatives 5 and 6, 11,939 acres (5 percent) of the Planning Area would be available for geothermal leasing and surface occupancy (see Table 4-1 and Map 2-10). These alternatives include a small portion of PMV critical habitat south of SR-78.		Same as Alternatives 1 and 2.	Under Alternative 8, 35,115 acres would be available for geothermal leasing, however, PMV critical habitat is not included in available lands and would not likely be impacted under this alternative.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Special Status Species: Peirson's milk-vetch (cont.)								
OHV Management Area Designations	Under Alternative 1, 2,845 acres of PMV critical habitat would be closed to OHV recreation, while the remainder of the Planning Area would be limited (1,385 acres) or open (7,661 acres) to OHV recreation (see Table 4-1, Table 4-6 and Map 2-19). OHV recreation within the open OHV recreation areas of critical habitat would likely result in the loss of habitat, disturbance of species, and direct mortality from OHV recreation.	Under Alternative 2, 2,275 acres of PMV critical habitat would be open to OHV recreation, with 9,617 acres closed (Table 4-6 and Map 2-20).	Under Alternatives 3 and 5, only 9 acres of PMV critical habitat would be open to OHV recreation (Table 4-6). Motorized travel would not be authorized within 11,882 acres of proposed closed OHV management areas, and loss of habitat, disturbance of species, and direct mortality from OHV recreation would not occur (Table 4-6, Maps 2-21 and 2-23).	Under Alternative 4, impacts to PMV critical habitat would be greater than under Alternatives 3 and 5 but less than under Alternatives 1, 2, 6, and 7 (Table 4-6 and Map 2-22). Under this alternative, 9,353 acres of PMV critical habitat would be closed to OHV recreation and 1,527 acres would be open to OHV recreation. A small portion, 1,012 acres, of PMV critical habitat would be designated as a seasonal restriction area (limited OHV) based on a rainfall threshold (Map 2-22).	Same as Alternative 3.	Under Alternatives 6 and 7, a portion of PMV critical habitat would be closed to OHV recreation (Table 4-6, Maps 2-24 and 2-25). Under Alternatives 6 and 7, there would be 5,271 and 3,394 acres, respectively, open to OHV recreation within the Planning Area. Critical habitat units known to have the highest densities of PMV would be closed to OHV recreation under these alternatives (6,620 acres under Alternative 6 and 8,497 acres under Alternative 7).		All PMV critical habitat would be closed to OHV recreation under Alternative 8. Motorized travel would not be authorized within PMV critical habitat of proposed closed OHV management areas; loss of habitat, disturbance of species, and direct mortality from OHV recreation would not occur.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Special Status Species: Peirson's milk-vetch (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind leasing would be the highest, resulting in greater potential impacts to PMV critical habitat. Under these alternatives, 188,833 acres would be available for solar and wind development, including most portions of PMV critical habitat, except that found in the North Algodones Dunes Wilderness (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss of habitat, disturbance of species, and direct mortality of PMV.		Under Alternative 3, all portions of PMV critical habitat are excluded from solar and wind development (see Table 4-1 and Maps 2-30, 2-32, 2-34, and 2-36), and no impacts to PMV critical habitat are likely to occur.	Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas, including portions of PMV critical habitat. An avoidance area is defined as an area only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization. PMV critical habitat may be adversely impacted under these alternatives if solar and wind energy proposals have no other reasonable location. Under these alternatives, critical habitat within the North Algodones Dunes Wilderness would continue to be excluded.			Same as Alternatives 1 and 2.	Same as Alternative 3.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Special Status Species: Mojave Desert Tortoise								
Geothermal Leasing	Impacts to Mojave desert tortoise from geothermal development would vary by alternative. Geothermal development would have the greatest impacts to desert tortoise under Alternatives 1 and 2. Under these alternatives, all of potential desert tortoise habitat along the eastern portion of the Planning Area (east of the UPRR tracks), would be available for geothermal development and surface occupancy (see Table 4-1, Maps 2-7 and 2-11).		Under Alternative 3, no geothermal development would be allowed within the Planning Area (see Table 4-1 and Map 2-8). Under this alternative, desert tortoise habitat would not be impacted by geothermal development.	Under Alternative 4, 188,426 acres of the Planning Area would be available for geothermal development but with an NSO stipulation (see Table 4-1 and Map 2-9). Desert tortoise habitat within the Planning Area would likely not be impacted under this alternative.	Under Alternatives 5 and 6, 11,939 acres (5 percent) of the Planning Area would be available for geothermal development and surface occupancy (see Table 4-1 and Map 2-10). Only a small portion of these acres are located within potential desert tortoise habitat (north of SR-78, east of the UPRR tracks). Under these alternatives, impacts to desert tortoise may occur but would likely be minimal overall.		Same as Alternatives 1 and 2	
OHV Management Area Designations	Mojave desert tortoise habitat east of the UPRR tracks would continue to be limited to OHV recreation. Limited OHV recreation would likely result in minimal loss of habitat, disturbance of species, and potential direct mortality from OHV and other recreation, as well as from other motorized vehicles.							

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Special Status Species: Mojave Desert Tortoise (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind development would be the highest, resulting in greater potential impacts to desert tortoise habitat. Under these alternatives, 188,833 acres would be available for solar and wind development, including all of potential desert tortoise habitat (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss of habitat, disturbance of species, and possible direct mortality of tortoise.		Under Alternatives 3, 4, 5, and 6, the majority of tortoise habitat would also be available for solar and wind development (see Table 4-1 and Maps 2-30, 2-31, 2-32, 2-34, 2-35, and 2-36); impacts to tortoise and potential habitat may occur under these alternatives as well.				Same as Alternatives 1 and 2.	Same as Alternatives 3 through 6.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
State Listed and BLM Sensitive Species								
Geothermal Leasing	Under Alternatives 1 and 2, the majority of the Planning Area, 188,426 acres, would be available for geothermal development and, in turn, potential adverse impacts to special status species would be greater. Under these alternatives, there would be increased potential for the loss of vegetative resources, loss of habitat, disturbance of species, and potential direct mortality due to geothermal construction and development activities within the Planning Area (see Table 4-1).		Geothermal development would have the lowest potential adverse impacts under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8).	Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 188,426 acres of the Planning Area would be available for geothermal development but with an NSO stipulation (Map 2-9).	Under Alternatives 5 and 6, geothermal development would be limited to 11,939 acres within the Planning Area (see Table 4-1 and Map 2-10). Adverse impacts to special status species would be concentrated in a relatively small portion of the Planning Area.		Same as Alternatives 1 and 2.	Under Alternative 8, geothermal leasing would be limited to 35,115 acres with 136,691 acres of NSO stipulation. Adverse impacts to special status species would be concentrated in a relatively small portion of the Planning Area.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environ-mental Element	Alternatives							
	1	2	3	4	5	6	7	8
State Listed and BLM Sensitive Species (cont.)								
OHV Management Area Designations	OHV area designations would have the highest level of potential adverse impacts to special status species under Alternative 1. Under this alternative, the majority of Planning Area, excluding the WA (26,098 acres), would be open or limited OHV recreation, increasing the potential for loss of habitat, disturbance of species communities, and potential direct mortality from OHV recreation activities.	Under Alternatives 2 and 3, the greatest number of acres (75,322 and 87,778 acres, respectively) would be closed to OHV recreation. Motorized travel would not be authorized within proposed closed OHV management areas, and loss of habitat, disturbance of species communities, and potential direct mortality from OHV recreation would no longer occur.		Under Alternatives 4, 5, and 6, impacts to wildlife resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8 (see Table 4-1).			Under Alternatives 7 and 8, impacts would be similar to those under Alternative 1; however, 36,743 and 35,144 acres, respectively, would be closed to OHV recreation under these alternatives, protecting 10,645 and 9,046 more acres than Alternative 1.	
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind development would be the highest, resulting in greater potential impacts to special status species. Under these alternatives, 188,833 acres would be available for solar and wind development (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss of habitat, disturbance of species, and possible direct mortality.		Impacts to special status species from solar and wind development would the lowest under Alternative 3 as this alternative reduces the number of acres available for development.	Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas. An avoidance area is defined as an area only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization.			Same as Alternatives 1 and 2.	

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
State Listed and BLM Sensitive Species: Colorado Desert fringe-toed lizard and Flat-tailed horned lizard								
OHV Management Area Designations	Under Alternative 1, the majority of habitat for these species would be open or limited to OHV recreation (about 78 percent of the Planning Area), potentially resulting in loss or displacement of species.	Under Alternatives 2 and 3, the highest number of acres would be closed to OHV recreation (30 to 34 percent of the Planning Area), resulting in lessened adverse impacts to these species.		Under Alternatives 4, 5, 6, and 7, and 8 impacts to species and habitat would be similar to those discussed under Alternative 1, although more acres of the psammophytic scrub vegetation community would be closed to OHV recreation under these alternatives, protecting additional acres of important habitat for these species.				
Wildland Fire								
Geothermal Leasing	Impacts to wildland fire management would be similar under each of the alternatives.							
OHV Management Area Designations								
Solar and Wind Energy Development								

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Cultural Resources								
Geothermal Leasing	Under Alternatives 1 and 2, the majority of the Planning Area, 188,426 acres, would be available for geothermal leasing and, in turn, potential adverse impacts to cultural resources would be greater. Under these alternatives, there would be increased potential for destruction and/or degradation of cultural resources due to geothermal construction and development activities within the Planning Area (see Table 4-1).		Geothermal leasing would have the lowest potential adverse impacts under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8).	Potential adverse impacts within the Planning Area related to geothermal facilities and development would be low under Alternative 4. Under this alternative, 188,426 acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area, where cultural resources may occur.	Under Alternatives 5 and 6, geothermal leasing would be limited to 11,939 acres within the Planning Area (see Table 4-1 and Map 2-10). Adverse impacts to cultural resources would be concentrated in a relatively small portion of the Planning Area.		Same as Alternatives 1 and 2.	Under Alternative 8, geothermal leasing would be limited to 35,115 acres with 136,691 acres of NSO stipulation. Adverse impacts to cultural resources would be concentrated in a relatively small portion of the Planning Area

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Cultural Resources (cont.)								
OHV Management Area Designations	OHV area designations would have the highest level of potential adverse impacts to cultural resources under Alternative 1. Under this alternative, the majority of the Planning Area, excluding the WA (26,098 acres), would be open or limited OHV recreation, increasing the potential for destruction and/or degradation of cultural resources from OHV recreation activities.	Under Alternatives 2 and 3, the greatest number of acres (75,322 and 87,778 acres, respectively) would be closed to OHV recreation. Motorized travel would not be authorized within proposed closed OHV management areas, destruction and/or degradation from OHV recreation would no longer occur.		Under Alternatives 4, 5, and 6, impacts to cultural resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8 (see Table 4-1).			Under Alternatives 7 and 8, impacts would be similar to those under Alternative 1; however, 36,743 and 35,144 acres, respectively, would be closed to OHV recreation under these alternatives, protecting 10,645 and 9,046, respectively, more acres than Alternative 1.	

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Cultural Resources (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind leasing would be the highest, resulting in greater potential impacts to cultural resources. Under these alternatives, 188,833 acres would be available for solar and wind development, except the WA (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential destruction and/or degradation of cultural resources.		Under Alternative 3, only 47,131 acres would be available for solar and wind lease and development (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36), resulting in a lower potential for destruction and/or degradation of cultural resources.	Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas. An avoidance area is defined as an area only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization. Cultural resources may be adversely impacted under these alternatives if solar and wind energy proposals have no other reasonable location.			Same as Alternatives 1 and 2.	Under Alternative 8, only 35,115 acres would be available for solar and wind lease and development (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36), resulting in a lower potential for destruction and/or degradation of cultural resources.
Paleontological Resources								
	Alternatives providing more acreage for OHV recreation, camping, construction activities, as well as renewable energy and geothermal leasing activities would result in greater impacts (see Table 4-1). Differences in impacts to vertebrate fossils and scientifically significant invertebrate resources by alternative would be similar to those outlined in Section 4.9.2 for Cultural Resources above.							

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Visual Resources								
Geothermal Leasing	Under Alternatives 1 and 2, 71,598 acres and 104,739 acres of VRM Class II, respectively, would be available for geothermal leasing and potential adverse impacts to viewsheds would be greater. Under these alternatives, there would be increased potential for the loss of visual quality due to geothermal construction and development activities within VRM Class II areas (Table 4-7).		Geothermal leasing would have the lowest potential adverse impacts to visual resources under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Table 4-7 and Map 2-8).	Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 104,739 of VRM Class II acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area, where the view from the Planning Area may be adversely impacted.	Under Alternatives 5 and 6, geothermal leasing would be limited to 5,088 acres of VRM Class II within the Planning Area (Table 4-7 and Map 2-10). Adverse impacts to visual resources would be concentrated in a relatively small portion of the Planning Area (two percent).		Under Alternatives 7 and 8, there would be 16,031 and 3,190 acres of VRM Class II available for geothermal leasing. Adverse impacts to visual resources within VRM Class II would be similar to those for Alternatives 5 and 6, covering a relatively small portion of the planning area overall (between one and seven percent).	

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Visual Resources (cont.)								
OHV Management Area Designations	OHV area designations would have the highest level of potential adverse impacts to visual resources under Alternative 1. Under this alternative, no acres within the Planning Area would be closed (0 acres) to OHV recreation within VRM Class II, increasing the potential for adverse impacts to visual quality and viewsheds from OHV recreation activities.	Under Alternative 2, 19 percent of the Planning Area would be closed (41,908 acres) to OHV recreation within VRM Class II, resulting in low to moderate impacts to visual quality and viewsheds from OHV recreation activities.	Under Alternative 3, 28 percent of the Planning Area would be closed (61,291 acres) to OHV recreation in VRM Class II, resulting in low impacts to visual quality and viewsheds from OHV recreation activities.	Alternatives 4, 5, and 6 may result in moderate potential impacts to visual quality and viewsheds within VRM Class II. Under these alternatives, 10 to 12 percent of the Planning Area would be closed to OHV recreation within VRM Class II.			Alternatives 7 and 8 would close three to four percent of the Planning Area, respectively, of VRM Class II to OHV recreation, resulting in similar impacts as those for Alternative 1 (Table 4-7).	

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Visual Resources (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind leasing under VRM Class II would be the highest, resulting in greater potential impacts to visual resources (Table 4-7). Under these alternatives, 71,758 and 104,739 acres, respectively, would be available for solar and wind development (Table 4-7 and Maps 2-29 and 2-33), resulting in potential impacts to visual quality and viewsheds. Under Alternatives 1 and 2, there would be no avoidance or exclusion acres for solar and wind energy development.		Under Alternative 3, 45,226 acres would be available and 128,568 acres of VRM Class II would be excluded from solar and wind lease and development (Table 4-7 and Maps 2-30 and 2-34), resulting in lower potential impacts to visual quality and viewsheds overall. Under this alternative there would be no avoidance acres for solar and wind energy development.	Under Alternatives 4, 5, and 6, there would be 3,419 acres available, 99,905 acres would be designated as avoidance areas, and 1,415 acres would be excluded in VRM Class II, resulting in moderate to high potential impacts depending on avoidance area development.			Under Alternative 7, 16,031 acres within VRM Class II would be available for development, potentially resulting in moderate impacts to visual quality and viewsheds. Under Alternative 7 there would be no avoidance or exclusion acres for solar and wind development for VRM Class II.	Under Alternative 8, 3,190 acres would be available and 101,549 acres would be excluded from solar and wind development. Under this alternative there would be no avoidance acres. Impacts to VRM Class II from this alternative would be the lowest of the alternatives overall.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Special Designations								
Geothermal Leasing	Under Alternatives 1 and 2, the East Mesa ACEC (6,454 acres) and 298 acres of the Plank Road ACEC would be available to geothermal development, potentially resulting in adverse impacts to the natural and cultural values of these areas.		Under Alternative 3, land within the ACECs would not be available for geothermal development.	Under Alternative 4, land within the East Mesa ACEC (5,802 acres) and Plank Road ACEC (298 acres) would be available for geothermal leasing with no surface occupancy. No impacts to natural and cultural resource values would likely occur under this alternative (Table 4-8).	Same as Alternative 3.		Under Alternative 7, the East Mesa ACEC (5,802 acres) and 298 acres of the Plank Road ACEC would be available to geothermal development, potentially resulting in adverse impacts to the natural and cultural values of these areas.	Similar to Alternative 4, but the Plank Road ACEC would not be available to geothermal; no impacts to natural and cultural resource values would likely occur under these alternatives (Table 4-8).
OHV Management Area Designations	Under all alternatives, the WA (the North Algodones Dunes ACEC under Alternative 1) would be closed to OHV recreation. Under all alternatives, OHV recreation within the East Mesa ACEC would be limited to designated routes (6,454 acres under Alternatives 1 and 2, 5,802 acres under all other alternatives), resulting in reduced potential adverse impacts to natural and cultural resources. Under all alternatives, 298 acres of the Plank Road ACEC would be open to OHV recreation, potentially resulting in disturbance to sensitive natural and cultural resources within the majority of this ACEC (Table 4-8).							

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Special Designations (cont.)								
Solar and Wind Energy Development	For solar and wind energy, under Alternatives 1 and 2, the East Mesa ACEC (6,454 acres) and 298 acres of the Plank Road ACEC would be available to development.		Under Alternative 3, no solar or wind energy development would be allowed within the East Mesa or Plank Road ACECs.	Under Alternatives 4, 5, and 6, the East Mesa ACEC and Plank Road ACEC would be avoidance areas for solar and wind energy. Under these alternatives, potential impacts to sensitive natural and cultural resources with ACECs may occur if no other reasonable areas for development are found.			For solar and wind energy, under Alternative 7, the East Mesa ACEC (5,802 acres) and 298 acres of the Plank Road ACEC would be available to development.	Same as Alternative 3.
Mineral Resources								
Geothermal Leasing	Under Alternatives 1 and 2, 188,426 acres of the Planning Area would be available and 26,098 acres (the WA) would not be available for geothermal leasing.		Under Alternative 3, geothermal leasing would not be allowed (no available acres) within the Planning Area.	Under Alternative 4, 188,426 acres would be available for geothermal leasing but with an NSO stipulation, thereby reducing surface disturbing activities within the Planning Area.	Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing and the remainder of the Planning Area, 202,991 acres, would be unavailable.		Same as Alternatives 1 and 2.	Under Alternative 8, 35,115 acres would be available and 14,025 acres would be available with an NSO stipulation, the remainder of the Planning Area, 136,691 acres, would be unavailable (see Table 4-1).

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Recreation								
OHV Management Area Designations	120,393 ac. would be designated as open, 26,098 ac. (WA) would be designated as closed, and 68,440 ac. would be designated as limited OHV management areas. Camping would continue to be allowed within the microphyll woodlands south of SR 78 and north of I-8 and within the Dunebuggy Flats campground.	87,713 ac. would be designated as open, 75,322 ac. (including the WA) would be designated as closed, and 51,896 ac. would be designated as limited OHV management areas. Camping would continue to be allowed within the microphyll woodlands south of SR 78 and north of I-8 and within the Dunebuggy Flats campground.	The least number of ac. would be designated as open (74,676 acres), the greatest number of acres would be designated as closed (87,778 ac.), and 52,478 ac. would be designated as limited OHV management areas. Camping would continue to be allowed within the microphyll woodlands south of SR 78. There would be the potential for campgrounds in the Dunebuggy Flats and Gecko areas to be closed	105,843 ac. would be designated as open, 55,220 ac. (including the WA) would be designated as closed, and 53,868 ac. would be designated as limited OHV management areas. Alternatives 5 and 6 would be similar to Alternative 4.Camping would continue to be allowed within the microphyll woodlands south of SR 78 and north of I-8 and within the Dunebuggy Flats.	103,839 ac. would be designated as open, 58,614 ac. (including the WA) would be designated as closed, and 52,477 ac. would be designated as limited OHV management areas. Camping would continue to be allowed within the microphyll woodlands south of SR 78 and north of I-8 and within the Dunebuggy Flats campgrounds.	108,914 ac. would be designated as open, 53,539 ac. (including the WA) would be designated as closed, and 52,478 ac. would be designated as limited OHV management areas. Camping would continue to be allowed within the microphyll woodlands south of SR 78 and north of I-8 and within the Dunebuggy Flats campgrounds.	125,710 ac. would be designated as open, 36,743 ac. would be designated as closed OHV management (including the WA), and 52,478 ac. would be designated as limited OHV management areas. Camping would continue to be allowed within the microphyll woodlands south of SR 78 and north of I-8 and within the Dunebuggy Flats campgrounds.	The greatest number of acres would be designated as open OHV management, 127,416 ac., 35,144 ac. would be designated as closed (including the WA), and 52,370 ac. would be designated as limited. Campgrounds south of Wash 25 and north of Wash 69, as well as the Dunebuggy Flats campground, would be closed to camping but open to OHV use.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Transportation and Access								
Geothermal Leasing	Alternatives 1 and 2. Under these alternatives, 188,426 acres would be available for geothermal leasing, potentially disrupting or eliminating existing roadways and routes within the Planning Area.		Geothermal leasing would have the lowest potential adverse impacts to transportation and access under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8).	Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 188,426 acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area, where transportation and access of the Planning Area may not be impacted.	Under Alternatives 5 and 6, geothermal leasing would be limited to 11,939 acres within the Planning Area (see Table 4-1 and Map 2-10). Potential adverse impacts to transportation and access would likely be concentrated in a relatively small portion of the Planning Area (five to 16 percent) under these alternatives.		Same as Alternatives 1 and 2.	Under Alternative 8, impacts to transportation and access would be marginally higher (35,115 acres versus 11,939 acres) than Alternatives 5 and 6. Potential adverse impacts to transportation and access would likely be concentrated in a relatively small portion of the Planning Area under this alternative.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Transportation and Access (cont.)								
OHV Management Area Designations	Transportation and access would likely remain the same.		Under Alternative 3, proposed closed OHV management areas within the ISD SRMA could potentially lead to the closure of the Dunebuggy Flats campground, depending on PMV rainfall thresholds and southern portions of Gecko campgrounds may potentially be closed.	Same as Alternatives 1 and 2.				Similar to Alternative 3. Campgrounds south of Wash 25 and north of Wash 69 would be closed to camping but open to OHV use.The Dunebaggy Flats campground would be closed depending on PMV rainfall thresholds.
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind leasing would be the highest, resulting in greater potential impacts to transportation and access. Under these alternatives, 188,833 acres would be available for solar and wind development, except the WA (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss or reduction of travel routes and access.		Under Alternative 3, 47,131 acres would be available for solar and wind lease and development (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36), resulting in a lower potential for loss or reduction of travel routes and access.	Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas. Transportation and access may be adversely impacted under these alternatives if solar and wind energy proposals have no other reasonable location.			Same as Alternatives 1 and 2.	Under Alternative 8, 35,416 acres would be available for solar and wind lease and development (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36), resulting in a lower potential for loss or reduction of travel routes and access.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Lands and Realty (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind leasing would be the highest. Under these alternatives, 188,833 acres would be available for solar and wind development (including PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs); the 26,098 acres in the WA would be excluded (see Table 4-1 and Maps 2-29 and 2-33).		Under Alternative 3, 47,131 acres within the Planning Area would be available for solar and wind development; the WA as well as the remainder of the Planning Area would be excluded (including PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs) (see Table 4-1 and Maps 2-30, 2-32, 2-34, and 2-36).	Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as development avoidance areas (including PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs) and 39,694 acres would be available.			Same as Alternatives 1 and 2.	Under Alternative 8, 35,115 acres within the Planning Area would be available for solar and wind development; the WA as well as the remainder of the Planning Area would be excluded (including PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs) (see Table 4-1 and Maps 2-30, 2-32, 2-34, and 2-36).

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Public Health and Safety								
Geothermal Leasing	Geothermal leasing availability would have the greatest potential adverse impacts to public health and safety under Alternatives 1 and 2.		Geothermal leasing would have the lowest potential adverse impacts to public health and safety under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8).	Potential adverse impacts within the Planning Area related to geothermal facilities and development would be low under Alternative 4, 188,426 acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area.	Under Alternatives 5 and 6, potential adverse impacts to public health and safety would likely be concentrated in a relatively small portion of the Planning Area (11,939 acres or five percent).		Same as Alternatives 1 and 2.	Under Alternative 8, impacts to public heath and safety would be marginally higher (35,115 acres versus 11,939 acres) than Alternatives 5 and 6. Potential adverse impacts to public health and safety would likely be concentrated in a relatively small portion of the Planning Area under this alternative.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Public Health and Safety (cont.)								
OHV Management Area Designations	Depending on the location of closed OHV management areas, changes in visitor use patterns and density of visitors could occur. Under Alternatives 1 and 2, access and campground availability would likely remain the same.		Under Alternatives 3 and 8, proposed closed OHV management areas within the ISD SRMA could potentially lead to the closure of the southern portions of the Gecko campgrounds and Dunebuggy Flats (depending on PMV rainfall thresholds). These closures could likely lead to increased densities of visitors within remaining campgrounds, potentially increasing disputes between visitors and public safety personnel.	Same as Alternatives 1 and 2.				Under Alternative 8, proposed closed OHV management areas within the ISD SRMA could potentially lead to the closure of the Dunebuggy Flats cmapground, depending on PMV rainfall thresholds. These closures could likely lead to increased densities of visitors within remaining campgrounds, potentially increasing disputes between visitors and public safety personnel.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Public Health and Safety (cont.)								
Solar and Wind Energy Development	Under Alternatives 1 and 2, lands available for solar and wind leasing would be the highest. Under these alternatives, 188,833 acres would be available for solar and wind development; the 26,098 acres in the WA would be excluded (see Table 4-1 and Maps 2-29 and 2-33). Under these alternatives, there would be an increased risk to public health and safety from collision with infrastructure related to development.		Under Alternative 3, 47,131 acres within the Planning Area would be available for solar and wind development; the WA as well as the remainder of the Planning Area would be excluded (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36). Under this alternative, potential collisions and other public health and safety issues related to infrastructure would be minimized.	Under Alternatives 4, 5, and 6, 144,290 acres of land would be designated as development avoidance areas and 39,694 acres would be available for development. Within the avoidance areas, development may occur if no other reasonable alternative is found. Public health and safety issues under these alternatives may be moderate, depending on the areas developed for solar and wind facilities.			Same as Alternatives 1 and 2.	Under Alternative 8, 35,416 acres within the Planning Area would be available for solar and wind development; the WA as well as the remainder of the Planning Area would be excluded (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36). Under this alternative, potential collisions and other public health and safety issues related to infrastructure would be minimized.

TABLE 2-20
COMPARISON OF IMPACT BY ALTERNATIVE (CONT.)

Environmental Element	Alternatives							
	1	2	3	4	5	6	7	8
Public Health and Safety (cont.)								
Public Access	Under Alternatives 1 and 2, public access and travel adjacent to the US-Mexico border would remain open. Under these alternatives, potential unsafe encounters with border enforcement activities and illegal activities related to the US-Mexico border would continue.		Under Alternative 3, the area within 100 feet of the US-Mexico border would be closed to public access and travel, potentially reducing unsafe encounters with speeding law enforcement vehicles, smugglers, and other border related hazards.	Under Alternatives 4, 5, and 6, a 60-foot area (called the Roosevelt Reservation) adjacent to the US-Mexico border would be closed to public travel and access, also potentially reducing unsafe encounters as mentioned for Alternative 3.			Same as Alternatives 1 and 2.	
Social and Economic								
Geothermal Leasing	Despite the potential increase in demand for mineral resources in and around the planning area, no impact to or change in community lifestyle is anticipated. If and when a project is proposed to the BLM, the BLM and operator(s) would need to prepare a project-specific POD. Each POD would need to address the potential impacts (including economic and social impacts) of a proposed geothermal mineral lease and development.							
OHV Management Area Designations	The designation of closed OHV management areas would result in the loss of motorized recreational opportunities, which would directly impact visitors' use of the Planning Area. The majority of closed OHV management areas (26,098 acres) for all alternatives is the congressionally-designated wilderness. No significant economic impacts from recreation activities within the Planning Area were determined for any of the proposed alternatives.							
Solar and Wind Energy Development	Social impacts of renewable energy development relate primarily to visual impacts and loss of access. There is no current commercial production of solar or wind energy on BLM-administered lands within the Planning Area. If and when a project is proposed to the BLM, the BLM and operator(s) would need to prepare a project-specific POD. Each POD would need to address the potential impacts (including economic and social impacts) of a proposed solar or wind development.							

CHAPTER 3.0
Affected Environment

3.1 Introduction

The Planning Area, which contains the ISD SRMA, is a unique recreation resource in the southwestern US. The sand dune system within the Planning Area is of a size and height that is unparalleled. The Planning Area fills a unique and valued niche for providing rural, roaded, natural, and semi-primitive OHV recreation opportunities.

The dunes are bordered on the west by the New Coachella Canal, which delivers Colorado River water to the agricultural industry of the Coachella Valley to the north and west. A major route of the UPRR traverses the eastern edge of the Planning Area. SR-78 divides the northern third of the Planning Area from the southern portion. I-8 traverses the southern portion of the Planning Area. Ogilby Road runs north-south between SR-78 and I-8 along the southeast portion of the Planning Area. Mammoth Wash runs through the ISD SRMA to the north. The Planning Area is shown in Map1-1.

This chapter describes the environmental components of BLM-administered lands in the Planning Area that would potentially be affected by implementation of the DRAMP. This chapter is organized by resources, special designations, public health and safety, resource uses, social and economic considerations, and environmental justice conditions. Resources include air, soil, water, vegetative communities, wildlife, special status species, wildland fire ecology and management, and cultural, paleontological, and visual resources. Special designations include ACECs and the WA. Resource uses include lands and realty, minerals, recreation management, and transportation and public access.

Information sources and analysis data utilized to write this chapter were obtained from various management planning documents from BLM. Information and data were also collected from many other related planning documents and research publications prepared by various federal and state agencies, as well as from private publications pertaining to the resources found within the Planning Area, key resource conditions, and resource uses. The purpose of this chapter is to provide a description of key resources found within the existing environment of the Planning Area, which will be used as a baseline to evaluate and assess the impact of the eight resource management alternatives. Descriptions and analyses of the impacts themselves are presented in Chapter 4—Environmental Consequences.

3.2 Air and Atmospheric Values

3.2.1 Climate and Meteorology

The Planning Area is located within the Lower Colorado River Valley subdivision of the Sonoran Desert, which is classified as a dry tropical climate (Brown 1994). The Planning Area is located in Imperial County, which is in the Salton Sea Air Basin (SSAB). The climate of Imperial County exhibits characteristics typical of the Sonoran Desert: low annual precipitation, very hot summers, mild winters, high evaporation rates, low humidity, and strong inversions. One of the main determinants of climatology is a semi-permanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, weakened low-pressure storms and the orographic barrier bring little rainfall. The combination of subsiding air, protective mountains, and distance from the ocean severely limits precipitation (Imperial County 2008a).

In Imperial County, annual precipitation fluctuates widely from about 1 to 6 inches, averaging 2.97 inches annually (Imperial County 2007). Temperature ranges from lows around 30°F in January to highs around 110°F in July and August. Mean low temperature is 55°F, and mean high temperature is 90°F (Imperial County 2007). Winter daytime highs are in the 60°F–70°F range from December through March, and freezing temperatures are rare. Winter winds approach from the northwest. Summer winds are more variable, but often blow from the southeast.

The flat terrain of Imperial Valley and the strong temperature differentials created by intense solar heating produce moderate winds and deep thermal convection. The Imperial Valley region occasionally experiences periods of high winds. Predominant wind directions are westerly and west-southwesterly during all four seasons, and average annual daily wind speed is 4.1 miles per hour (Imperial County 2008a).

A common atmospheric condition known as a temperature inversion affects air quality in the Planning Area. An inversion acts like a lid, keeping normal convective overturning of the atmosphere from penetrating through the inversion. This can cause several weather-related effects, such as the trapping of pollutants below the inversion and allowing them to build up. The inversion layer can persist for one or more days, causing air stagnation and buildup of pollutants. Highest or worst-case ozone levels are often associated with the presence of this type of inversion. Subsidence inversions are common from November through June, but appear to be relatively absent July through October (Imperial County 2008a).

3.2.1.1 Climate Change

Ongoing scientific research has identified the potential impacts of anthropogenic (man-made) greenhouse gas (GHG) emissions and changes in biological carbon sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused concentrations of CO_2 equivalents to increase dramatically and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC) recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-twentieth century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC 2007).

Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24° N) have exhibited temperature increases of nearly 2.1°F since 1900, with nearly a 1.8°F increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2001, the IPCC (IPCC 2001) indicated that by the year 2100, global average surface temperatures would increase 2.5 to 10.4°F above 1990 levels. The National Academy of Sciences has confirmed these findings, but also has indicated that there are uncertainties regarding how climate change may affect different regions (IPCC 2007). Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures. Increases in temperatures would increase water vapor in the atmosphere and reduce soil moisture, increasing generalized drought conditions, while at the same time enhancing heavy storm events. Although large-scale spatial shifts in precipitation distribution may occur, these changes are more uncertain and difficult to predict.

As with any field of scientific study, there are uncertainties associated with the science of climate change. This does not imply that scientists do not have confidence in many aspects of climate change science. Some aspects of the science are known with virtual certainty, because they are based on well-known physical laws and documented trends (EPA 2008).

Several activities contribute to the phenomena of climate change, including emissions of GHGs (especially CO_2 and methane) from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales. For example, recent emissions of CO_2 can influence climate for 100 years.

It may be difficult to discern whether global climate change is already affecting resources, let alone the Planning Area for the DRAMP. In most cases there is more information about potential or projected effects of global climate change on resources. Projected changes are likely to occur over several decades to a century. Therefore, many of the projected changes associated with climate change may not be measurably discernible within the reasonably foreseeable future.

Rainfall patterns are also affected by global climate change. Total annual precipitation and statewide rainfall patterns are anticipated to change little over the next century; however, it is also possible that the intensity and frequency of extreme storm events could increase (State of California 2006). Continued global warming would cause a decrease in snowmelt and spring stream flows, which are the primary source of California's water supply. Demand for water resources due to an increasing economy and population are likely to continue to increase, potentially overstretching water supply. Agricultural areas would likely be the hardest hit, potentially losing up to 25 percent of needed water supply (State of California 2006). Statewide average temperatures are anticipated to increase between 3°F and 10.5°F by 2100. There is a potential for a greater number of days with temperatures in the 90°F to 100°F range, if temperatures rise to the modeled higher warming ranges. Higher temperatures increase the risks of dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Existing and anticipated effects of climate change resources and resource uses in the Planning Area are incorporated into the relevant sections. The following resources have been or are anticipated to be affected by climate change: water, vegetation, and wildlife.

3.2.2 Air Quality

Air quality is defined by ambient air concentrations of specific pollutants determined to be of concern with respect to the health and welfare of the general public. National air quality policies are regulated through the federal CAA of 1970 and its 1977 and 1990 Amendments. Pursuant to the CAA, the EPA has established primary and secondary NAAQS for six pollutants (carbon monoxide [CO], nitrogen dioxide [NO_2], PM_{10}, particulate matter less than 2.5 microns ($PM_{2.5}$), ozone, sulfur dioxide [SO_2], and lead). These pollutants are referred to as "criteria" pollutants, because numerical health-based

criteria have been established for each that define acceptable levels of exposure. Areas that violate a federal air quality standard are designated as non-attainment areas.

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, lead, and some particulates are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as ozone, NO_2, and some particulates are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. In general, emissions that are considered "precursors" to secondary pollutants in the atmosphere (such as reactive organic gases [ROG] and oxides of nitrogen [NO_x], which are considered precursors for ozone) are the pollutants for which emissions are evaluated to control the level of ozone in the ambient air.

Primary standards are adopted to protect public health, and secondary standards are adopted to protect public welfare. States are required to adopt ambient air quality standards which are at least as stringent as the federal NAAQS; however, the state standards may be more stringent. California has adopted standards more stringent than federal standards for some pollutants (Table 3-1). Areas within California in which ambient air concentrations of a pollutant are higher than the state, federal, or both standards are considered to be non-attainment areas for that pollutant.

The ICAPCD currently maintains six air quality monitoring stations. These stations are located in: El Centro, Brawley, Calexico Ethel, Calexico East, Westmorland, and Niland. The ICAPCD conducts yearly and quarterly inspections of the monitoring stations (ICAPCD 2008).

3.2.2.1 Health Effects of Criteria Air Pollutants

Air pollutants are recognized to have a variety of health effects on humans. Research by the California Air Resources Board (CARB) shows that exposure to high concentrations of air pollutants can trigger respiratory diseases such as asthma, bronchitis, and other respiratory ailments and cardiovascular diseases. A healthy person exposed to high concentrations of air pollutants may be become nauseated or dizzy, may develop a headache or cough, and may experience eye irritation or a burning sensation in the chest. Ozone is a powerful irritant that attacks the respiratory system, leading to the damage of lung tissue. Inhaled particulate matter, NO_2, and SO_2 can directly irritate the respiratory tract, constrict airways, and interfere with the mucous lining of the airways. When it is absorbed into the bloodstream, CO can endanger hemoglobin, the oxygen-carrying protein in blood, by reducing the amount of oxygen that reaches the heart, brain, and other body tissues. When air pollutant levels are high (a common occurrence

in southern California), children, elderly people, and people with respiratory problems are advised to remain indoors. Outdoor exercise also is discouraged when levels are high because strenuous activity may cause shortness of breath and chest pains (CARB 2005).

3.2.2.2 Toxic Air Contaminants

The federal and state laws and regulations also define a group of pollutants called "hazardous air pollutants," "toxic air contaminants," or "air toxics." These pollutants are regulated by the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) section of the federal CAA, various state laws and regulations, state air toxics acts (e.g., the AB 1807, AB 2588, and SB 1731 programs), and ICAPCD Regulations XI and XII. In urban areas, toxic air contaminants are a concern because of the concentration of people living close to large sources of emissions. The combination of toxic emissions from vehicles, industry, and multiple area sources creates an unhealthy mix that varies based on geography, industry, population, and other factors. Exposure to toxic air pollutants may cause or contribute to cancer, birth defects, genetic damage, and other adverse health effects.

In Imperial County, the ICAPCD is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws, regulations, and policies. Included in the tasks for ICAPCD are the monitoring of air pollution, the preparation of the SIP for Imperial County, and the promulgation of Rules and Regulations. The SIP includes strategies and tactics to be used to attain the federal ozone standard in Imperial County. The elements are taken from the Air Quality Attainment Plan, the ICAPCD plan for attaining the state ozone standard, which is more stringent than the federal standard. The Rules and Regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts (ICAPCD 2007).

3.2.2.3 Federal Clean Air Act Conformity

The CAA Amendments of 1977 (42 USC 7401, et seq.) state that the federal government is prohibited from engaging in, supporting, providing financial assistance for, licensing, permitting, or approving any activity that does not conform to an applicable SIP. Federal actions related to transportation plans, programs, and projects developed, funded, or approved under 23 USC or the Federal Transit Act (49 USC 1601, et seq.) are covered under separate regulations for transportation conformity.

In the 1990 CAA Amendments, EPA included provisions requiring federal agencies to ensure that actions undertaken in non-attainment or attainment-maintenance areas are consistent with applicable SIPs. The ICAPCD has adopted Rule 925, general conformity.

TABLE 3-1
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.07 ppm (137 µg/m^3)		0.0775 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	Non-dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	Gas Phase Chemilumine-scence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm		–		
Lead[h]	30 days average	1.5 µg/m^3	Atomic Absorption	–	–	–
	Calendar Quarter	–		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-month Average[i]	–		0.15 µg/m^3		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	–	Pararosoaniline
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	–	
	3 Hour	–		–	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (665 µg/m^3)		–	–	

TABLE 3-1
AMBIENT AIR QUALITY STANDARDS (CONT.)

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[h]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: CARB 2008

ppm = parts per million; µg/m^3 = micrograms per cubic meter.

[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact US EPA for further clarification and current federal policies.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25° C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25° C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[f] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[g] Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

[h] The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[i] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

The process of determining whether or not a federal action is consistent with applicable SIPs is called conformity. The general conformity rules establish a process to demonstrate that federal actions would be consistent with applicable SIPs and would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of the NAAQS, or delay the timely attainment of the NAAQS. The emission thresholds that trigger requirements of the conformity rule are called *de minimis* levels.

A determination of conformity with the applicable SIP is required for each pollutant where the total direct and indirect emissions in a non-attainment or attainment-maintenance area caused by the action would exceed *de minimis* levels. The general conformity *de minimis* thresholds are defined in 40 CFR 93.153(b) and in Rule 1501. In addition, the project proponent must demonstrate that the total direct and indirect emission increases associated with the action will not be regionally significant; that is, they will not represent 10 percent or more of an emission inventory or emissions budget of an area. The general conformity rules do not apply to federal actions in areas designated as non-attainment of the CAAQS only.

On November 30, 1993, the EPA promulgated its rules for determining general conformity of federal actions with state air quality implementation plans, as required by CAA Section 176(c). To demonstrate conformity with a local SIP, a project must clearly demonstrate that it does not:

- Cause or contribute to any new violation of any standard in the area
- Interfere with provisions in the applicable SIP for maintenance or attainment of air quality standards
- Increase the frequency or severity of any existing violation of any standard
- Delay timely attainment of any standard, any interim emission reduction, or other milestones included in the SIP for air quality

The EPA has developed specific procedures for conformity determinations for federal actions, which include preparing an assessment of emissions associated with the project based on the latest and most accurate emissions estimating techniques.

3.2.2.4 Compliance with Air Quality Standards

Under the 1977 Amendments to the CAA, those states with air quality that did not achieve the NAAQS were required to develop and maintain SIPs. These plans constitute a federally enforceable definition of the approach (or plan) of the state and schedule for the attainment of the NAAQS. Air quality management areas are designated as attainment, non-attainment, or unclassified depending on whether or not they achieve

the NAAQS and CAAQS. In addition, California can also designate areas as transitional. Because the NAAQS and CAAQS are different in many cases, it is possible for an area to be designated as attainment by EPA (meets the NAAQS) and non-attainment by the CARB (does not meet the CAAQS) for the same pollutant. Also, an area can be designated as attainment for one pollutant (e.g., NO_2) and non-attainment for others (ozone and PM_{10}).

Areas that were designated as attainment in the past, but have since achieved the NAAQS, are further classified as attainment-maintenance. The maintenance classification remains in effect for 20 years from the date that the area is determined by EPA to meet the NAAQS. There are numerous classifications of the non-attainment designation, depending on the severity of non-attainment. For example, the ozone-non-attainment designation has seven subclasses: transitional, marginal, moderate, serious, severe-15, severe-17, and extreme. Areas that lack monitoring data are designated as unclassified areas and treated as attainment areas for regulatory purposes.

Imperial County has been classified by the EPA as moderate non-attainment for the 8-hour ozone NAAQS. Under this classification, Imperial County is required to develop an 8-hour Ozone Air Quality Management Plan. Moderate non-attainment areas are required to attain the standard "as expeditiously as practicable," but no later than six years after classification or June 15, 2010. State and federal standards for ozone and PM_{10} are currently exceeded within the ICAPCD. Imperial County has developed an Air Quality Management Plan to focus on the 8-hour O_3 non-attainment problem as well as provide adequate planning and air quality management (Imperial County 2008a).

In 2008, the EPA revised the primary standard for lead from 1.5 micrograms per cubic meter ($\mu g/m^3$) to 0.15 $\mu g/m^3$ over a rolling three-month period. The 1978 lead NAAQS will be retained until one year after designations for the new standards, except in current non-attainment areas. States are required to make recommendations for areas to be designated attainment, non-attainment, or unclassified by October 2009.

The CARB monitors ambient air quality at approximately 250 air quality monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Factors affecting ground-level pollutant concentrations include the rate at which pollutants are emitted to the atmosphere, the height from which they are released, the physical combination of emissions from various sources, the formation of secondary pollutants, the interaction of pollutants with topographic features, and meteorological conditions. Meteorological parameters that affect pollutant dispersion the most are wind speed and direction, atmospheric stability, mixing height, and temperature.

Ambient criteria air pollutant concentrations in the SSAB are measured at six air quality monitoring stations operated by ICAPCD and CARB. The nearest air quality monitoring

station operating in the vicinity of the Planning Area is located at Calexico East, approximately 20 miles to the southwest. The station monitors ozone, CO, NO_2, SO_2, PM_{10}, and lead.

3.2.2.5 Sources of Regional and Local Pollution

Although Imperial County experiences temperature inversions almost daily, these inversions are usually broken, allowing pollutants to more easily disperse. The atmosphere is stable enough to allow PM_{10} pollution to accumulate and frequently reach elevated concentrations across the southern border of Imperial County. Under stagnant and light wind conditions, elevated dust concentrations in Mexicali, Mexico, can cause PM_{10} to drift across the border into the US town of Calexico (Imperial County 2008b). Mexicali comprises approximately 760,000 people within about 200 square miles and has PM_{10} emissions estimated at 257 tons/day, compared with emissions of about 13 tons/day for the considerably smaller town of Calexico (population approximately 32,000).

High concentrations of PM_{10} in many areas in Imperial County result from wind action. The wind picks up particles from disturbed and undisturbed surfaces, recreational travel on paved and unpaved roadways, construction and demolition activities, and farming operations such as crop burning. These particles can remain suspended in the air for long periods and can travel a great distance. The principal health effect of airborne particulate matter is on the respiratory system (Imperial County 2008b).

The primary contributors of air pollutants (PM_{10}) within lands administered by the ECFO in Imperial County are: OHV recreation; mining operations; geothermal energy operations; various short-term construction projects such as installation of utility lines; and naturally caused by wind (BLM 2006a). The ECFO has developed a *Fugitive Dust Control Plan* to identify sources of PM_{10} within lands administered by BLM and identify dust control measures that can be implemented to help minimize or eliminate emissions (BLM 2006a). A revised plan will be developed by BLM and submitted to Imperial County in Fall 2009.

Emissions sources associated with the existing use of the Planning Area consist of combustion emissions from OHVs; small internal-combustion generator engines; recreational vehicles and on-road motor vehicles (commuting to, traveling within, and departing from the site); and fugitive dust emissions from vehicles traveling over paved and unpaved surfaces. The principal sources of criteria pollutant emissions are automobiles, recreational vehicles, and wind.

3.3 Soil Resources

The ISD are the largest mass of sand dunes in California. This dune system extends for more than 40 miles along the eastern edge of the Imperial Valley agricultural region in a band averaging five miles in width. It is roughly bordered on the west by the Coachella Canal, which delivers Colorado River water to the fertile agricultural valley to the north. A major east–west route of the UPRR skirts the eastern edge.

The dune system is situated on a relatively flat plain that has an elevation of approximately 50 feet above sea level. On the west, the plain is called East Mesa (because it is east of Imperial Valley). On the east, the plain is called Pilot Knob Mesa.

In the unique environment of the ISD, wind erosion and deposition have created the dune formations. The soils within the dunes shift naturally as a result of local wind patterns, creating the dynamic, constantly moving dunes system. Within the Planning Area and particularly within the washes and creosote scrub community, natural erosion occurs as a result of large storm events throughout the year.

The dunes reach heights of 300 feet above the plain and include classic examples of several different types of dunes. The sand dunes are thought originally to have been beach sands of ancient Lake Cahuilla, which occupied the Imperial Valley at a time when the Colorado River emptied into it instead of the Gulf of California. Unlike some major dune systems that have formed next to a mountain range, the Imperial Dunes have formed primarily as a result of opposing seasonal winds. Winter winds come from the northwest, but often reverse to the southeast in summer. The stronger winter winds are slowly pushing the dune system southeastward.

The east and west sides of the dune system differ substantially in character. West side sands are composed of material that is generally heavier and coarser than the lighter, finer sands carried further east in the prevailing winds. The coarse sands form the largest, tallest dunes, which are located in the western two-thirds of the dune system. These constitute the primary dunes. The tallest dunes are found toward the center of the overall dune mass, in the eastern half of the primary dune area. East of the primary dunes are the secondary dunes, smaller dunes composed of finer sands and having more vegetation cover (BLM 1987).

3.3.1 Sand and Soils

A soils report was written for Imperial County by the USDA NRCS (1981). The report's survey area is in the south–central portion of Imperial County and bounded by the US–Mexico border on the south, Algodones Sand Hills (western portion of the Planning Area) on the east, Salton Sea on the north, San Diego County on the northwest, and alluvial fans bordering the Coyote Mountains and Yuha Desert on the southwest.

The NRCS is currently working on the Colorado Desert Area soil report, which will include the Planning Area. Mapping for this effort is not complete. Based on the 1981 Imperial County soil survey report and information obtained from the NRCS Web Soil Survey tool (NRCS 2008), the western portion of the Planning Area is composed of 10 different soil series. The following are brief descriptions of the soil series within the Planning Area as described in the Imperial County soils report (NRCS 1981).

Antho Series (coarse–loamy, mixed) consists of very deep, well-drained soils that formed in alluvial deposits in basins of the lower Colorado River area. The natural vegetation is creosote bush, white bursage, ephedra, and ephemeral herbs and grasses. Antho soils are similar to Holtville, Indio, Meloland, Niland, Superstition, and Vint soils (NRCS 1981). This soil series is known to be present in scattered, small pocket areas throughout the western portion of the Planning Area, most of which lie south of SR-78 and just east of the Coachella Canal.

Carsitas Series (mixed) consists of very deep, excessively drained soils that formed in alluvial deposits of granitic and metamorphic origin on alluvial fans, beach ridges, and drainageways. The natural vegetation is scattered shrubs of wingscale, creostoebush, bursage, and ocotillo, with mesquite, palo verde, and smoketree in the drainageways. Carsitas soils are similar and near to the Niland, Rositas, Superstition, and Vint soils. They are also near the Holtville, Imperial, Indio, and Meloland soils (NRCS 1981). This soil series is known to be present in sparsely scattered, small areas, mostly south of SR-78 within the western portion of the Planning Area.

Holtville Series (clayey over loamy) consists of very deep, well-drained, stratified soils that formed in mixed alluvial deposits on flood plains, terraces, and basin floors. The natural vegetation is a sparse growth of quailbush, creosote bush, and mesquite. Holtville soils are similar to Imperial and Meloland soils. They are near the Imperial, Indio, Meloland, Niland, Rositas, and Vint soils (NRCS 1981). This soil series is known to be present in densely scattered pockets throughout the western portions of the Planning Area, most of which lie south of SR-78 and just east of the Coachella Canal.

Imperial Series (fine) consists of very deep, moderately well-drained soils that formed in recent alluvial deposits on flood plains and basins. The natural vegetation is a sparse growth of quailbush, creosote bush, inkweed, and pickleweed. Imperial soils are similar and near to the Holtville, Meloland, and Vint soils (NRCS 1981). This soil series is known to be present, in conjunction with the Holtville series, in densely scattered pockets throughout the western portions of the Planning Area, most of which lie south of SR-78 and just east of the Coachella Canal.

Indio Series (coarse–silty, mixed) consists of very deep, well-drained soils that formed in recent mixed alluvial or eolian material on flood plains and basins. The natural vegetation is scattered creosote bush, bursage, and wingscale. Indio soils are similar to the Antho, Meloland, and Vint soils. They are near the Holtville, Imperial, Meloland,

Niland, Rositas, and Vint soils (NRCS 1981). This soil series is known to be present in conjunction with the Vint series, scattered sparsely along the western side of the Coachella canal within the Planning Area.

Meloland Series (coarse–loamy over clayey, mixed) consists of very deep, well drained, stratified soils that formed in mixed alluvium on flood plains and alluvial basin floors. The natural vegetation is a sparse shrub growth of creosote bush, bursage, wingscale, and mesquite. Meloland soils are similar to Antho, Holtville, Indio, and Niland soils. They are near the Holtville, Imperial, Indio, Niland, Rositas, and Vint soils (NRCS 1981). This soil series is known to be present along the Coachella Canal within the western portion of the Planning Area.

Niland Series (sandy over clayey, mixed) consists of very deep, moderately well-drained, stratified soils that formed in mixed alluvium on the edges of flood plains and alluvial basins. The natural vegetation is a sparse shrub growth of creosote bush, bursage, wingscale, and mesquite. Niland soils are similar to and near Carsitas, Imperial, Meloland, Rositas, and Vint soils (NRCS 1981). This soil series is known to be present in scattered, small pocket areas within the western portion of the Planning Area.

Rositas Series (mixed sands) consists of very deep, somewhat excessively drained soils that formed in alluvial or eolian sands on flood plains, basins, terraces, and sandhills. The natural vegetation is shrub growth of creosote bush, bursage, wingscale, desert buckwheat, ephedra, and mesquite. Rositas soils are similar to and near the Antho, Carsitas, Meloland, Niland, Superstition, and Vint soils. They are also near the Holtville, Imperial, and Indio soils (NRCS 1981). The Rositas sands are the predominant soil series throughout the western portion of the Planning Area.

Superstition Series (sandy, mixed) consists of very deep, somewhat excessively drained soils that formed in sandy alluvial or eolian deposits from mixed sources on old terraces and alluvial fans. The natural vegetation is scattered creosote bush; ephemerals of the Plantago, Cyptantha, and Oenothera genera; and some white bursage and ephedra. Superstition soils are similar to and near the Carsitas, Rositas, and Vint soils. They are also near the Antho and Holtville soils (NRCS 1981). This soil series is known to be present in scattered, small pocket areas throughout the western portion of the Planning Area.

Vint Series (sandy, mixed) consists of very deep, well-drained soils that formed in mixed alluvial or eolian materials on flood plains and alluvial basins. The natural vegetation is a sparse shrub cover of wingscale, mesquite, creosote bush, and bursage. Vint soils are similar to and near the Antho, Indio, Rositas, and Superstition soils. Vint soils are also near the Holtville, Imperial, Meloland, and Niland soils (NRCS 1981). This soil series is known to be present in conjunction with the Indio series, scattered sparsely along the western side of the Coachella Canal within the Planning Area.

The western portion of the Planning Area is composed primarily of Rositas sands with lesser areas of Antho loamy fine sands and Holtville silty-clay loams. The Rositas sands range from loamy fine sands to fine sands and to medium sands. The larger-grained Rositas sands are mostly in the western, upwind section of the Planning Area with the finer sands located mostly on the eastern downwind side of the dunes area. Typically, the Rositas sands are stratified, with reddish yellow-to-light-brown coloring. These sands are formed in alluvial or eolian deposits from distant sources. Typically, the surface layer of the Rositas soil is light brown, loamy, fine sand about four inches thick. The underlying material is pinkish and very pale brown sand to a depth of 60 inches and can have thin gravelly subsurface layers. In many places, there are soils that have a sandy profile and a few thin lenses of fine sandy loam, silt loam, or silty clay loam. Permeability is rapid, and available water capacity is low. Surface runoff is slow, and there is a high hazard of soil blowing and abrasion to young plants. The effective rooting depth is 60 inches or more.

3.4 Water Resources

The Planning Area is located in the desert of southeastern California, an area marked by long, hot summers and meager rainfall. Surface water in the extended vicinity of the Planning Area includes the Salton Sea, the Colorado River, and the Gulf of California. Other than canals that carry Colorado River water to the Imperial Valley, water resources in the immediate vicinity of the Planning Area are limited.

3.4.1 Surface Water

There are no major lakes or reservoirs on BLM-administered lands within the Planning Area. There are two primary surface waterways in the vicinity of the Planning Area, the All-American Canal and the New Coachella Canal. There are also several surface water wildlife guzzlers (water retaining structures) within the Planning Area.

3.4.1.1 All-American Canal

The All-American Canal is approximately 80 miles long and part of the All-American Canal System, located in the southeastern corner of California, which consists of the Imperial Diversion Dam and Desilting Works, All-American Canal, Coachella Canal, and appurtenant structures (Bureau of Reclamation [BOR] 2008). The All-American Canal serves the Imperial and Coachella valleys in southern California and the Yuma Project in California and Arizona. The All-American Canal System was authorized under the Boulder Canyon Project Act of 1928, and construction began in 1934, following the construction of Hoover Dam. The canal system crosses the Colorado Desert and is entirely within the US. The first irrigation water was delivered in 1940. The BOR owns the canal, but it is operated by the Imperial Irrigation District (BOR 2008).

Water is diverted from the Colorado River into the canal at the Imperial Dam. Flow proceeds in a westerly direction, and smaller distributary canals carry water from it into the Imperial Valley and Coachella Valley. Approximately 3.1 million acre-feet of Colorado River water is delivered annually through the All-American Canal to nine cities and over 500,000 acres of agricultural lands throughout the Imperial Valley (Imperial Irrigation District 2006).

The All-American Canal has a capacity of 10,155 cubic feet per second (cfs) in the vicinity of the Planning Area (BOR 2008). Because portions of the canal are currently unlined, a substantial amount of water is believed to be lost through seepage. The San Diego County Water Authority began work on the All-American Canal Lining Project in 2007 to prevent seepage. Construction of the concrete-lined canal is expected to be completed in 2010 (San Diego County Water Authority 2007).

3.4.1.2 Coachella Canal

The New Coachella Canal is connected to the All-American Canal at what is known as Drop 1 in the southern Planning Area near I-8. The Coachella Canal originally was completed in 1948 as an unlined channel and had a flow capacity of approximately 2,500 cfs. The canal extends northwesterly from Drop 1 (All-American Canal) for approximately 123 miles and runs along the east side of the Salton Sea and west of the Planning Area. The first 49 miles of the Old Coachella Canal were replaced with a new canal called the New Coachella Canal in the early 1980s due to concerns about water loss through seepage in the East Mesa area. The Old Coachella Canal is no longer used to transport water (BOR 2008).

The 49-mile New Coachella Canal has a flow capacity of approximately 1,550 cfs and is concrete-lined to prevent seepage. Operating roads are located along either side of the newer canal. The New Coachella Canal has a bottom width of approximately 16 feet and ranges in depth from 10 to 12 feet. It runs northwest along the approximate western boundary of the ISD SRMA.

3.4.1.3 Wildlife Guzzlers

Seepage along the Old Coachella Canal resulted in a greenbelt and pools along the canal that supported various forms of wildlife. With construction and operation of the New Coachella Canal and the subsequent retirement of the southern portion of the Old Coachella Canal, wildlife dependent on the greenbelt and pools no longer had a water source. To partially mitigate the loss of this wetland habitat, the CDFG installed six wildlife guzzlers, five within the North Algodones Dunes WA and one wildlife guzzler in the Mammoth Wash area to the north of the WA (within Administrative Closure).

3.4.1.4 Ephemeral Surface Flows

Numerous washes that carry storm runoff exist within the Planning Area. These are particularly evident as generally east-to-west-flowing channels that have incised the distal alluvial fans of the Chocolate Mountains and the Cargo Muchacho Mountains in the eastern portion of the Planning Area. Ephemeral surface flows and pools form in the washes and low points in the eastern transition areas as a result of infrequent runoff events caused by cloudbursts in the nearby mountains. The ephemeral surface flows and pools most commonly occur in the springtime of wet years, but can also occur at other times. The pools do not remain for long periods following rains due to the permeable nature of the soils in this area.

3.4.2 Groundwater

The Planning Area falls within the Colorado River Hydrologic Region. The primary groundwater basin located in the Planning Area is the Imperial Valley Basin. Analyses of the Imperial Valley Basin indicate that the groundwater quality is unusable without treatment due to elevated levels of total dissolved solids (TDS); fluoride and boron levels are also elevated (DWR 2004). The total storage capacity of the Imperial Valley Basin is 14,000,000 acre-feet with the amount of stored water unknown (DWR 2004).

Several observation wells associated with the All-American Canal were installed within the Planning Area by the BOR in the early 1980s. These wells were installed in close proximity to the canal because canal water seepage into the groundwater was of concern (BOR 1994). The wells are no longer read on a regular basis, and the canal is being lined to prevent seepage (see 3.4.1.1 above).

The state agencies that implement groundwater-related monitoring programs are the SWRCB and Regional Water Quality Control Boards (RWQCBs), DWR, Department of Health Services (DHS), Department of Toxic Substances Control (DTSC), and Department of Pesticide Regulation (DPR). These agencies are represented on the Interagency Task Force. Federal agencies that implement groundwater-related monitoring programs include the EPA, BOR, and the United States Geological Survey (USGS). The DWR requires that water from newly constructed wells be sampled, and the water quality assessed. The Imperial County Public Health Department, Section of Environmental Health and Consumer Protection Services regulates the design, construction, maintenance, and destruction of water wells throughout Imperial County to protect the county's groundwater resources.

The laws and regulations applicable to the public supply wells establish numerical water quality criteria for contaminants, called Maximum Contaminant Levels (MCLs), to protect public health.

3.4.3 Watershed Basins and Hydrologic Units

The Planning Area is located within the Colorado River (Region 7) watershed basin. The Colorado River Basin includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego counties. Within these watersheds are the smaller Imperial and Amos–Ogilby hydrologic units.

3.4.4 Water Use

Water use on BLM-administered lands in the Planning Area consists primarily of wildlife use (guzzlers). The Buttercup Ranger Station has potable water, while the Cahuilla Ranger Station has only non-potable water. None of the BLM-administered campgrounds in the Planning Area have potable water sources.

3.4.5 Regulatory Setting

Clean Water Act

The CWA extensively amended the Federal Water Pollution Act of 1948. The objective of the Federal Water Pollution Control Act, commonly called the CWA (PL 92-500, as amended; 33 USC §§ 1251 et seq.) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters (Section 101a). Under Sections 401 and 404, the CWA regulates point- and non-point-source pollution and, along with EO 11990 titled *Protection of Wetlands, Impacts to Wetlands.*

The CWA has three major approaches to water pollution control:

1. Construction grants for reducing municipal discharges;
2. National Pollutant Discharge Elimination System (NPDES) permits for control of point source (storm water and waste water) discharges
3. Water quality management planning for non-point-source control from diffuse natural origins such as sediment

In 1972, Congress adopted a "zero-discharge" goal and a focus on "preventable causes of pollution" to emphasize the source of contamination rather than controls at the outfall or water body itself. Water quality standards include a legal designation of the desired use for a given body of water and the water quality criteria appropriate for that use. The criteria are specific levels of water quality which are expected to make a water body suitable for its desired use. "Effluent limitations" are restrictions on quantities, rates, and concentrations in wastewater discharges measured at the discharger's outfall pipe.

Administration of Section 401 of the act is delegated to the SWRCB in California and, locally, to the Colorado River RWQCB. The RWQCB is responsible for setting water quality standards and criteria for water bodies in the regional plan, and for issuing and enforcing NPDES permits. A NPDES permit is currently not required for BLM activities in the ISD SRMA. The 401 Water Quality Certification application is available on the internet (http://www.swrcb.ca.gov).

Section 13241 of the California Water Code provides that each RWQCB shall establish water quality objectives for the waters of the state (i.e., ground and surface waters) which, in the RWQCB's judgment, are necessary for the reasonable protection of beneficial uses and prevention of nuisance. Section 303 of the CWA requires the state to adopt water quality objectives for surface waters. The Colorado River RWQCB has established surface and groundwater quality objectives and water quality standards for contaminants (DWR 2005).

The DWR is the primary state agency mandated to address water quantity (water supply) information (DWR 2005).

3.4.6 Federal Reserved Water Rights for Designated Wilderness Areas

Federal water rights, which mostly supersede state water laws, can be asserted on federally managed lands. The federal government is required, however, to submit all reserved water rights claims to the state's adjudication process, limited by the 'primary purpose' and 'minimal needs' requirements. In addition, federal reserved water rights are nontransferable. Once a land transfer occurs, the federal water rights are no longer valid (BLM 2006b).

Reserved water rights in an area designated as wilderness are "set aside pursuant to the Wilderness Act of 1964 (16 USC Section 1131). . . . The Wilderness Act reserves the amount of water within the Wilderness Area necessary to preserve and protect the specific values responsible for designation of the area and to provide for public enjoyment of these values" (BLM 2006b).

In addition, federal reserved water rights for the WAs were explicitly established by statute at Section 707 of the CDPA.

3.4.6.1 Beneficial Use Designations

The Planning Area is located in the Colorado River Basin within the jurisdiction of the RWQCB District 7 (RWQCB7). The Colorado River Basin includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego counties. The RWQCB7 approved the *Basin Plan for the Colorado River Basin* in 1993, and this plan established

beneficial use designations for the All-American Canal, Coachella Canal, and Amos-Ogilby hydrologic unit.

3.5 Vegetation Resources

3.5.1 Vegetation Communities

The primary vegetation communities within the Planning Area are: creosote bush scrub, microphyll woodland, psammophytic scrub, and canal-influenced vegetation (Westec 1977; BLM 1987). Vegetation communities are depicted in Map 3-1 and described in detail below.

3.5.1.1 Creosote Bush Scrub

Creosote bush scrub is the most common vegetation community in the Colorado Desert and typically occurs on well-drained secondary soils of slopes, fans, and valleys. Within the Planning Area, this vegetation community occurs on the relatively stable soils along the periphery of the dune system. It rarely occurs in the central portion of the Planning Area, where shifting dunes are prevalent. This vegetation community is generally characterized by relatively barren ground between widely spaced shrubs. To the west of the Planning Area, the community consists of almost pure stands of creosote bush. On the eastern boundary of the Planning Area, the vegetation is more diverse due to the topographic relief of the dunes and runoff from the nearby Chocolate and Cargo Muchacho mountains. The creosote bush scrub within the alluvial fan between the desert washes forms a transitional zone with the microphyll woodland vegetation community. The creosote scrub vegetation community covers approximately 80,981 acres of the entire Planning Area. Characteristic plant species of this community include creosote bush (*Larrea tridentata*), brittlebush (*Encelia farinosa*), and burrobush (*Ambrosia dumosa*). Less abundant species associated with this community include woolly desert marigold (*Baileya pleniradiata*), birdcage evening-primrose (*Oenothera deltoides*), dyebush (*Dalea emoryi*), longleaf jointfir (*Ephedra trifurca*), desert thorn-apple (*Datura discolor*), big galleta (*Hilaria rigida*), white rhatany (*Krameria grayi*), and brown plume wirelettuce (*Stephanomeria pauciflora*).

3.5.1.2 Microphyll Woodland

To the east of the dune system is a large alluvial fan draining the Chocolate and Cargo Muchacho mountains. The alluvial fan is dissected by numerous ephemeral washes and separated by expansive, level interfluves. The desert microphyll woodland vegetation community typically is best developed in the larger drainages where dense stands of a variety of trees occur. Microphyll woodlands are generally found along the margins of these dry channels and around the cul-de-sac sinks of their terminii. This vegetation

community covers approximately 21,992 acres of the entire Planning Area. Vegetation is generally sparse in the open wash areas between the sinks. Typical vegetation of this community includes palo verde, ironwood, smoke tree, and to a lesser degree honey mesquite, desert willow, and desert unicorn plant (*Proboscidea altheafolia*). Depending on rainfall, the understory in the plains is generally composed of shrubs and annuals such as desert starvine (*Brandegea bigelovii*), carrizo mallow (*Sphaeralacea orcuttii*), California threeawn, Mediterranean grass (*Schismus barbatus*), lineleaf white puff (*Oligomeris linifolia*), and rush milkweed (*Asclepias subulata*).

3.5.1.3 Psammophytic Scrub

Psammophytic scrub occurs within the interior dune system where active and partially stabilized dunes are found. This vegetation community occurs most frequently between active dunes in depressions that are commonly termed "bowls." The soils in these areas consist primarily of fine sand. As the dunes shift from year to year, the bowls generally shift as well. Vegetation is adapted to relatively high sand mobility and deep water percolation. Most of these plant species are capable of rapid growth given favorable soil moisture conditions. This vegetation community covers approximately 106,247 acres of the entire Planning Area. Common vegetation within this community includes Mormon tea, Colorado desert buckwheat, desert dicoria (*Dicoria canescens*), common sandpaper plant (*Petalonyx thurberi*), desert panicum (*Panicum urvilleanum*), and plicate coldenia (*Tiquilia plicata*). Additionally, birdcage evening primrose (*Oenothera deltoids*) and desert lily (*Hesperocallis undulata*) may occur in the relatively stable dunes that form a transitional zone with the creosote bush scrub vegetation community.

3.5.1.4 Canal-influenced Vegetation

Both the Coachella and All-American canals support hydrophytic vegetation that is subject to periodic eradication efforts. Although the canals are lined, some seepage occurs and promotes the growth of hydrophytic vegetation. Submergent species include shortspike watermilfoil (*Myriopphyllum exalbescens*) and fennel-leaf pondweed (*Potamogeton pectinatus*). Emergent and upland species include cattails (*Typha* spp.), spotted cadythumb (*Polygonum fusiforme*), horseweed (*Conyza canadensis*), spiny chloracantha (*Aster spinosus*), giant reed (*Arundo donax*), small-flowered tamarisk (*Tamarix parviflora*), false daisy (*Eclipta alba*), common sunflower (*Helianthus annuus*), white sweetclover (*Melilotus albus*), and arrow weed (*Pluchea sericea*).

3.5.2 Priority Plant Species

Priority plant species are rare, unusual, or key species that are not BLM sensitive or listed as threatened and endangered. They are worthy of special treatment and indicate ecological health, biological diversity, and unique habitats. A number of priority plant species are either known or suspected to occur on BLM-administered lands within the

Planning Area based on direct observations or presence of the species within the vicinity of BLM-administered lands.

Priority plant species that are known from or near the BLM-administered lands within the Planning Area are listed in Table 3-2 below.

TABLE 3-2
PRIORITY PLANT SPECIES

Common Name	Scientific Name	Habitat(s) Found
Blue palo verde	*Cercidium floridum* spp. *floridum*	Microphyll woodland
Catclaw acacia	*Acacia greggii*	Microphyll woodland
Ironwood	*Olneya tesota*	Microphyll woodland
Mesquite	*Prosopis glandulosa*	Microphyll woodland
Sand food	*Pholisma sonorae*	Psammophytic scrub
Smoketree	*Psorothamnus spinosus*	Microphyll woodland

3.5.2.1 California Native Plant Society Species

The CNPS is a professional society of botanists, biologists, scientists, and other associated professionals who have accumulated a statewide database on California native plant abundance and distribution. The CNPS has developed four categories to describe the status of plant species as: rare, threatened, endangered, or extinct. Although these listings do not afford legal status or protection for the species, agencies consult the list in their planning process for activities that may potentially impact any of these species. The listing categories are as follows:

- **CNPS 1A**: Plant Species presumed to be extinct in California.
- **CNPS 1B**: Plant species presumed to be rare, threatened, or endangered in California and elsewhere.
- **CNPS 2**: Plant species presumed to be rare, threatened, or endangered in California but common elsewhere.
- **CNPS 3**: Plant species for which more information is needed to be properly categorized, and includes an assemblage of taxa that have been transferred from other lists or have been suggested to CNPS for consideration.
- **CNPS 4**: Plant species that are not currently threatened or vulnerable but are considered to have limited distribution in California and, because of their uncommon status, should be monitored.

A number of CNPS species are either known or suspected to occur on BLM-administered lands within the Planning Area based on direct observations or presence of the species within the vicinity of BLM-administered lands (Table 3-3).

TABLE 3-3
CNPS SPECIES

Common Name	Scientific Name	CNPS Status
Borrego milk-vetch	*Astragalus lentiginosus* var. *borreganus*	CNPS-4.3
California ditaxis	*Ditaxis serrata* var. *californica*	CNPS-3.2
Coulter's lyrepod	*Lyrocarpa coulteri* var. *palmeri*	CNPS-4.3
Crown-of-thorns	*Koeberlinia spinosa* spp. *tenuispina*	CNPS-2.2
Desert unicorn plant	*Proboscidea altheafolia*	CNPS-4.3
Fairy duster	*Calliandra eriophylla*	CNPS-2.3
Foxtail cactus	*Coryphantha alversonii*	CNPS-4.3
Giant Spanish needle	*Palafoxia arida* var. *gigantea*	CNPS-1B.3
Glandular ditaxis	*Ditaxis clariana*	CNPS-2.2
Hairy stickleaf	*Mentzelia hirsutissima*	CNPS-2.3
Harwood milk-vetch	*Astragalus insularis* var. *harwoodii*	CNPS-2.2
Munz's cholla	*Opuntia munzii*	CNPS-1B.3
Orocopia sage	*Salvia greatae*	CNPS-1B.3
Ribbed cryptantha	*Cryptantha costata*	CNPS-4.3
Rock nettle	*Eucnida rupestris*	CNPS-2.2
Sand food	*Pholisma sonorae*	CNPS-1B.2
Thurber's pilostyles	*Pilostyles thurberi*	CNPS-4.3
Wiggins' croton	*Croton wigginsii*	CNPS-2.2
Winged cryptantha	*Cryptantha holoptera*	CNPS-4.3

Note: The CNPS Threat Rand is an extension added to rare plant ranking to designate the level of endangerment by a 0.1 to 0.3) ranking, with 0.1 being most endangered and 0.3 being the least endangered. Threat ranks are as follows: 0.1 = seriously threatened in California (high degree/immediacy of threat); 0.2 = fairly threatened in California (moderate degree/immediacy of threat); and 0.3 = not very threatened in California (low degree/immediacy of threats or no current threats known). Source – California Native Plant Society 2009.

3.5.2.2 California Natural Diversity Database

The CNDDB is a program provided by the CDFG that inventories the status and locations of rare plants and animals in California. The goal of the CNDDB is to provide the most current information available on the state's imperiled plants and wildlife and to provide tools to analyze these data (CNDDB 2009a). The BLM uses the CNDDB to gather spatial data (population and individual occurrences) about plant and wildlife species that occur on BLM-administered lands.

3.5.3 Invasive and Noxious Weed Species

Throughout southern California, native vegetation has been altered by the introduction—and in many cases dominance—of non-native plant species, some of which can change ecosystem dynamics dramatically. These invasive and noxious weed species compete with native plant species for water, nutrients, or sun; disrupt processes such as soil nitrogen cycling or pollination relationships; or predispose an area to wildfire by creating excess fuel loads. Several non-native species have the ability to completely change the structure of the vegetation community, making it unsuitable to most native wildlife species. Special status wildlife and plant species are particularly at risk from these invasive weed species.

Some non-native plants that occur in very low numbers or seem innocuous for years may expand their range dramatically and become a difficult pest weed under the right environmental conditions. These conditions might be brought about by a year with very late rains or a flood that results in heavy sedimentation of drainages leading to the establishment of riparian weeds.

Signed in February 1999, EO 13112 directs federal agencies to identify and manage invasive species. The order stipulates that actions will be taken to prevent the introduction of invasive species, monitor for their presence, and respond rapidly to eliminate them.

An effective way to implement these actions is through the Federal Noxious Weed Act of 1975, which requires federal land managers to develop a management program to control undesirable plants on federal lands under the agency's jurisdiction and to cooperate with state and federal agencies to manage undesirable plants.

The BLM maintains a federal list of noxious weeds of concern. In addition, the State of California and California Invasive Plant Council (Cal-IPC) also maintain lists that focus particularly on California. Based on these lists, the ECFO determined the invasive and/or noxious weeds that occur or are likely to occur in the Planning Area (Table 3-4).

TABLE 3-4
INVASIVE AND/OR NOXIOUS WEEDS KNOWN OR WITH THE POTENTIAL TO OCCUR IN THE PLANNING AREA

Common Name	Scientific Name
Saharan mustard	*Brassica tournefortii*
Ripgut brome	*Bromus diandrus*
Red brome	*Bromus madritensis* spp.
Redstem filaree	*Erodium cicutarium*
Russian thistle	*Salsola tragus*
Mediterranean steppegrass	*Stipa capensis*
Tamarisk	*Tamarix* spp.

3.6 Wildlife

3.6.1 General Wildlife

The Planning Area provides habitat for an abundance of wildlife species, including numerous birds, mammals, reptiles and invertebrates. The ISD SRMA is one of the largest dune ecosystems in the US and there are many species that are endemic to this unique area. As mentioned in Section 3.5, Vegetative Resources, several vegetation communities are found within the Planning Area, providing habitat features for a variety of wildlife species.

Wildlife commonly associated with the creosote bush scrub vegetation community includes desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), western whiptail lizard (*Cnemidophorus tigris*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), lesser nighthawk (*Chordeiles acutipennis*), black-tailed gnatcatcher (*Polioptila melanura*), yellow-rumped warbler (*Dendroica coronata*), white-crowned sparrow (*Zonotrichia leucophrys*), big brown bat (*Eptesicus fuscus*), kit fox (*Vulpes macrotis*), roundtail ground squirrel (*Spermophilus tereticaudus*), and black-tailed hare (*Lepus californicus*). The endemic Hardy's dune beetle (*Anomala hardyorum*) and Carlson's dune beetle (*Anomala carlsoni*) are also found in this vegetation community (Hardy and Andrews 1979).

The plant diversity and density combined with the micro-topographic variability associated with the washes in the Planning Area accounts for a high diversity of wildlife in the microphyll woodlands. The wildlife commonly associated with this vegetation community includes side blotched lizard (*Uta stansburiana*), western whiptail lizard, zebra-tailed lizard, sidewinder rattlesnake (*Crotalus cerastes*), red-tailed hawk, Gambel's quail (*Lophortyx gambelli*), mourning dove, ladder-backed woodpecker (*Picoides scalaris*), verdin (*Auriparus flaviceps*), western flycatcher (*Empidonax difficilis*), cactus wren (*Campylorhynchus burnneicapillus*), warbling vireo (*Vireo gilvus*), wilson's warbler (*Wilsonia pusilla*), house finch (*Carpodacus mexicanus*), black-tailed gnatcatcher, white-crowned sparrow (*Zonotrichia leucophrys*), western pipistrelle bat (*Pipistrellus hesperus*), coyote (*Canis latrans*), kit fox, mule deer (*Odocoileus hemionus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), black-tailed hare, and desert cottontail (*Sylvilagus audubonii*).

The wildlife commonly associated with psammophytic scrub include black-tailed gnatcatcher, mourning dove, cliff swallow (*Hirundo pyrrhonota*), coyote, roundtail ground squirrel, desert kangaroo rat (*Dipodomys deserti*), and black-tailed hare. The endemic Andrew's dune scarab beetle (*Psuedocotalapa andrewsi*) is also found in this habitat type (Hardy and Andrews 1979).

The canal-influenced vegetation community is utilized by a variety of birds including American coot (*Fulica americana*), red-wing blackbird (*Agelaius phoeniceus*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), common yellowthroat (*Geothlypis trichas*), and marsh wren (*Cistothorus palustris*). Common mammals of this community include black-tailed hare, coyote, raccoon (*Procyon lotor*), and American badger (*Taxidea taxus*).

Table 3-5 (on next page) lists additional wildlife species that are known or have the potential to occur within the Planning Area.

3.6.2 Wildlife Habitat Improvements

The CDFG installed six wildlife guzzlers, five within the North Algodones Dunes WA and one in the Mammoth Wash area to the north of the WA (within the Administrative Closure) to serve as wildlife waters. The wildlife guzzlers were installed by the CDFG to partially mitigate impacts from the construction of the New Coachella Canal. These guzzlers have created limited herbaceous weedy vegetation within the microphyll woodlands. The presence of water and forage around the guzzlers has attracted mule deer from the Chocolate Mountain range. Mule deer are known to use the microphyll woodland vegetation community associated with washes as corridors through the North Algodones Dunes Wilderness and into the southern part of the Mammoth Wash area. It is thought that the Yuma puma (*Felis concolor browni*) has preyed upon mule deer within the microphyll woodlands in the Planning Area.

3.6.3 Priority Wildlife Species Habitat

The priority wildlife identified by the BLM for management includes raptors, non-game migratory birds, bats, and game animals. The following provides a brief description of the basic needs of each of these wildlife categories.

Raptors. Raptors require a variety of foraging and nesting/roosting habitat. Most raptor species in the Planning Area require large open areas in which to hunt for small mammals. Most raptors nest in tall trees or rock cliffs.

Non-game migratory birds. Non-game migratory birds include neotropical migrants (the majority are songbirds, but also include shorebirds, raptors, and waterfowl), which are an important component of the ecosystem. They have a wide variety of habitat needs for food, water, cover, and nesting and are a good environmental indicator of overall ecosystem health.

TABLE 3-5
ADDITIONAL WILDLIFE SPECIES OF INTEREST THAT OCCUR OR POTENTIALLY OCCUR IN THE PLANNING AREA

Common Name	Scientific Name	Common Name	Scientific Name
Mammals		Birds (continued)	
Colorado River cotton rat	*Sigmodon arizonae plenus*	Sharp-shinned hawk	*Accipiter striatus*
Desert pallid bat	*Antrozous pallidus pallidus*	Turkey vulture	*Cathartes aura*
Desert woodrat	*Neotoma lepida*	Vaux's swift	*Chaetura vauxi*
Greater western mastiff bat	*Eumops perotis californicus*	Western screech owl	*Otus kennicottii*
Merriam's kangaroo rat	*Dipodomys merriami*	Insects	
Occult little brown bat	*Myotis lucifugus occultism*	Algodones bee	*Perdita algodones*
White-throated woodrat	*Neotoma albigula venusta*	Algodones croton jewel beetle	*Agrilus harenus*
Wild burro	*Equus asinus*	Algodones sand jewel beetle	*Lepismadora algodones*
Yuma hispid cotton rat	*Sigmodon hispidus eremicus*	Algodones wasp	*Euparagia* spp.
Yuma myotis	*Myotis yumanensis*	Algodones white wax jewel beetle	*Prasinalia imperialis*
Yuma mountain lion	*Felis concolor browni*	Andrews' dune scarab beetle	*Pseudocotalpa andrewsi*
Birds		Brow-tassel weevil	*Trigonoscuta brunnotasselata*
Ash-throated flycatcher	*Myiarchus cinerascens*	Carlson's dune scarab beetle	*Anomala carlsoni*
American kestrel	*Falco sparverius*	Cheeseweed owlfly	*Oliarves clara*
Barn owl	*Tyto alba*	Elegant sand wasp	*Microbembix elegans*
Black tern	*Chlidonias niger*		
Black-throated sparrow	*Amphispiza bilineata*	Glamis bee	*Perdita glamis*
Crissal thrasher	*Toxostoma dorsale*	Hardy's dune scarab beetle	*Anomala hardyorum*
Gilded northern flicker	*Colaptes auratus chrysoides*	Imperial velvet ant	*Dasymutilla imperialis*
Golden eagle	*Aquila chrysaetos*	Nocturnal velvet ant	*Dasymutilla nocturna*
Great horned owl	*Bubo virginianus*	Roth's dune weevil	*Trigonoscuta rothi*
LeConte's thrasher	*Toxostoma lecontei*	Wanda's dune scarab beetle	*Cyclocephala wandae*
Loggerhead shrike	*Lanius ludovicianus*	Amphibians	
Long-eared owl	*Asio otus*	Arizona southwestern toad	*Bufo microscaphus microscaphus*
Merlin	*Falco columbarius*	Couch spadefoot toad	*Scaphiopus couchii*
Mountain plover	*Charadrius montanus*	Reptiles	
Northern harrier	*Circus cyaneus*	Chuckwalla	*Sauromalus obesus*
Prairie falcon	*Falco mexicanus*		
Say's phoebe	*Sayornis saya*	Rosy boa	*Lichanura trivirgata*

The species found within the Planning Area include, but are not limited to, those listed in this table.

Bats. Bats have specialized roosting and breeding habitat requirements, often establishing colonies in caves/mines, rock outcrops, bridges, tree cavities, abandoned buildings, or other enclosed protected places. These species are nocturnal and will exit the roosting location in the evenings to forage for food within the vicinity of the colony.

Game animals. BLM is required to manage for the habitat of all game animals that occur on their administered lands within the Planning Area. Habitat features include ensuring there is sufficient food/forage, water, and cover/nesting locations. Mule deer and quail occur in the semi-desert vegetation communities.

3.6.4 Insects

An intensive survey of the insects of the Planning Area was done between September 2007 and September 2008 by the University of California, Bohart Museum of Entomology (Appendix G). Based on the initial data analysis of roughly 50,000 specimens collected during the 2007–2008 survey, a second year of inventory was initiated and was completed in 2009. Based on the two interim reports (Appendix G and Kimsey 2009), the conclusions in the following sub-sections were provided. In addition, a study of the diversity of velvet ants (Hymenoptera: Mutillidae; Pitts et al. 2009) found within the Planning Area was conducted and conclusions are provided in sub-sections below.

3.6.4.1 Insect Diversity

Of the 75,000 specimens collected thus far, 1,121 species have been identified so far and it is anticipated that once identification is complete, there will be nearly 1,500 insect species recorded for the Planning Area. There are insect groups that occur within the Planning Area, but that did not appear in samples, primarily due to the highly specialized collecting techniques and missing annual periods of activity by days or weeks. Groups that occur within the Planning Area that did not appear in the samples, but are likely to occur there based on other historic museum collections, include some jewel beetles (*Buprestidae*) and certain darkling beetles (*Tenebrionidae*), nocturnally active bees, some dragonflies, and walking sticks (Appendix G).

3.6.4.2 Correlations with Plant Diversity

A seemingly strong association between plant diversity and insect diversity was discovered. The greatest number of insects and the highest diversity of plants and insects were found within the microphyll woodlands on the eastern side of the dunes. Few endemic insect species were found, the plants and insects commonly occur across other regions of Imperial and Riverside counties, as well as western Arizona. The microphyll woodlands have a relatively large number of flowering plant species and a higher diversity of bees and insect parasitoids associated with bees and wasps. The

microphyll woodlands also provide a diversity of woody plants, trees, and shrubs that provide resources for insects and their parasites that forage on wood and foliage. Exposed sand, gravel, and silt of the washes within the microphyll woodlands provide nesting sites for ground-nesting wasps, predatory beetles, ants, and grasshoppers (Appendix G).

3.6.4.3 Endemic Species

A total of 64 insect species are known to be endemic to the Planning Area, including 34 newly described by these surveys. The majority of endemic insect species are found within the psammophytic scrub vegetation community, the sparse, scattered perennial plants and short-lived annuals of the dunes, or the open dunes (the barren ground interspersed within the psammophytic scrub vegetation community). These plants within the dunes serve as host plants and sources of nectar, and pollen for the endemic insect species. Surveys also found a large number of endemic insect species on woody perennial plants along Gecko Road, which is a high use recreation area during the winter. These plant species occur in very low numbers or do not occur at all in habitats adjacent to the Planning Area (Appendix G and Kimsey 2009).

3.6.4.4 Seasonal Abundance

Insect species numbers and diversity were highest during the months of March through October during daytime temperatures of 29° to 49° Celsius. Within this period, insect numbers and diversity experienced temporary increases several weeks after monsoon rainfalls between July and September. Endemic insect species were dominant during summer months and exotic species were dominant between November and March. Exotic species, such as the bean and pea aphid (*Aphidiidae*) and a variety of pest noctuid moths, including cutworms and army worms (*Noctuidae*), arrive from adjacent agricultural lands (Appendix G).

3.6.4.5 Endemic Plants

Endemic plants such as *Astragalus magdalenae* var. *peirsonii*, *Helianthus niveus* spp. *tephrodes*, and *Croton wigginsii*, were surveyed to determine insects visiting the plants. For *Astragalus magdalenae* var. *peirsonii*, only one pollinator, a large bee (likely *Habropoda pallida*), was observed visiting plants. Nesting aggregations for this bee species were found along north facing dune slopes within the North Algodones Dunes Wilderness, approximately one mile east of the New Coachella Canal road. Two exotic species, the bean and pea aphids, were also observed on *Astragalus* in March, but only winged adults were found, which suggests that this species cannot reproduce on this plant (Appendix G).

For *Helianthus niveus* spp. *tephrodes*, a species of Melissodes was observed pollinating. *Croton wigginsii* appears to be an important source of nectar for a variety of endemic insect species within the dunes (Appendix G).

3.6.4.6 Human Impacts

The majority of endemic insect species, such as root feeders, foliage feeders, and pollinators, were associated with perennial plants within the western and central dunes. Few seedlings of these perennial plants were observed within areas of high recreational use (areas with recreational vehicle access). High recreational use may cause sand compaction and disruption of insects that spend a portion of their life cycle in the sand. However, the endemic plant *Tiquilia* and the insects that are associated with this plant were found to be most abundant within disturbed areas along the New Coachella Canal and near the Cahuilla Ranger Station off Gecko Road, both high recreational use areas. The majority of the endemic insect species are active during the hot summer months (Appendix G; Kimsey 2009), when visitorship tends to be lowest. It appears that protecting vegetation will act as a surrogate for protecting endemic insect species.

3.6.4.7 Insect Species of Concern

The CDFG lists special animals as those taxa the CNDDB is interested in tracking, monitoring distribution, and determining potential threats. This list represents those species with conservation needs but does not convey any legal protection. Several insect species found within the Planning Area are listed as special animals and may be at risk, these include: Algodones sand jewel beetle; Andrew's dune scarab beetle; Carlson's dune scarab beetle; and Hardy's dune scarab beetle. Brief information about these species is found below. Information on other endemic insect species not listed by the CDFG may be found in the insect survey report (Appendix G).

3.6.4.7.1 Algodones Sand Jewel Beetle (*Lepismadora algodones*)

The Algodones sand jewel beetle has been observed visiting the flowers of coldenia (*Tiquila plicata*). This plant is widespread within the western portion of the Planning Area, but this beetle species is typically found near these plants growing adjacent to the Old Coachella Canal, west of the dunes. Mating most likely occurs on the adult host plant, coldenia. After mating, the female flies to a larval host plant to lay an egg on dead or dying tissue, where it hatches and bores into the plant roots. The life cycle is probably annual based on the small size of the adult beetle. Specimens have been observed in June and July with most observations from mid-June to early July where they are active from approximately during about mid-day (Velten and Bellamy 1987). No information about threats to this species is available.

3.6.4.7.2 Andrews' Dune Scarab Beetle (*Psuedocotalapa andrewsi*)

Likely endemic to the Planning Area, Andrews' dune scarab beetle is found primarily along the eastern edge of the dunes in the transitional zone between creosote bush scrub, psammophytic scrub, and microphyll woodland vegetation communities. Little is known about the biology of this beetle. Current information about the distribution and preferred habitat within the Planning Area is not available (CNDDB 2001). There are no confirmed host plants identified of the Andrews' dune scarab beetle. However, the adults of this species are known to swarm around creosote bushes, and may utilize the subsurface wet sand to regulate body temperature during the day (CNDDB 2001). No information about threats to this species is available.

3.6.4.7.3 Carlson's Dune Scarab Beetle (*Anomala carlsoni*)

The Carlson's dune beetle is likely endemic to the ISD system; however, there is limited information available about the microhabitat requirements or basic biology of this species (CNDDB 2001). The adult beetle is known to be active at dusk, generally on north- or east-facing slip faces. Generally, it seeks the transitional zone between creosote bush scrub, psammophytic scrub, and microphyll woodland habitats. Although there is no known host plant, the adult beetle has been sifted (collected) from a wide variety of plants (CNDDB 2001). No information about threats to this species is available.

3.6.4.7.4 Hardy's Dune Scarab Beetle (*Anomala hardyorum*)

Hardy's dune beetle is likely endemic to the ISD SRMA and is found primarily in the eastern portion of the Planning Area. The adult beetle is known to be active at dusk, generally on north- or east-facing slip faces. Generally, it seeks the transitional zone between creosote bush scrub, psammophytic scrub, and microphyll woodland habitats. The beetle also inhabits troughs of loose, drifting sand between the dune crests (BLM 1987). Although there is no known host plant, the adult beetle has been sifted (collected) from a wide variety of plants (CNDDB 2001). No information about threats to this species is available.

3.6.4.8 Velvet Ants of the Planning Area

The diversity of velvet ants found within the ISD was investigated and 40 species were found to inhabit areas on and around the dunes (Pitts et al. 2009). Of these species, four were found to be restricted to the dunes and another four were found to not be restricted to the dunes, but can be found in much greater abundance within the dunes than elsewhere. One new species of velvet ant was detected and recorded within the Planning Area (Pitts et al. 2009).

3.6.4.9 Sufficiency of Insect Surveys

There is still much to learn regarding invertebrates of the dunes. NEPA requires action agencies to use relevant data in the formulation of alternatives and in their assessment of foreseeable significant adverse impacts; however, information may be incomplete or unavailable. Information is considered incomplete or unavailable, when the overall cost of obtaining the information is exorbitant (40 CFR 1502.22). BLM recognizes that the insect sampling done thus far is incomplete. To attain a nearly complete inventory of the insect species of the dunes, it appears that a third season of sampling would be needed, but this sampling would need to occur during a "wet" year (Kimsey 2009). Additionally, to gather information on some families of insects, more specific collection methods would be needed, at an additional cost. While the species list is not complete, data collected thus far clearly indicate a strong relationship between dune insects and native vegetation associations. Given that the information on insects is unavailable, BLM would use vegetation as a surrogate for insects in its analysis of the potential impacts the alternatives may have on insects. BLM would assume that by protecting sufficiently large acres of each habitat type, the insects that rely upon these plants would also be protected.

3.7 Special Status Species

Special status species, as defined in BLM Manual 6840 (Special Status Species Management), include: 1) species listed or proposed for listing under the ESA; and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as BLM sensitive species. BLM sensitive species include both federal candidate species and delisted species within 5 years of delisting. For purposes of this discussion, "federally listed species" is a more narrowly defined term, referring to those species listed as endangered, threatened, or proposed under the ESA of 1973, as amended, including designated or proposed critical habitat, if applicable; as well as candidates for federal listing. Per Section 7(a) of the ESA, "All other Federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act."

The California ESA states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved (CDFG 2009).

BLM sensitive species are taxa that are not already included as BLM special status species under: 1) federally listed, proposed, or candidate species; or 2) State of

California listed species. BLM policy is to provide sensitive species with the same level of protection as is provided to candidate species, as stated in BLM Manual 6840, that is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed." The sensitive species designation is normally used for species that occur on BLM-administered lands for which BLM has the capacity to significantly affect the conservation of the species through management.

The basic policy of BLM is to: 1) conserve listed species and the ecosystems on which they depend and 2) ensure that actions authorized or carried out by BLM are consistent with the needs of special status species and do not contribute to the need to federally list any of these species. Protection is afforded to maintain the occurrence of these limited resources in accordance with existing laws and regulations to prevent their loss. Current federal and state protection regulations and categories are summarized below. Uncommon plants not offered special status as described below are not currently protected.

BLM has certain responsibilities for all special status species and as such does not reiterate listings provided by other agencies. The BLM sensitive species list is meant to be dynamic. If information shows that a species needs to be included or removed, Field Managers may make nominations with information supporting such action. Criteria for BLM sensitive species include those that are:

- Under status review by the USFWS/National Marine Fisheries Service
- Whose numbers are declining so rapidly that federal listing may become necessary
- With typically small and widely dispersed populations
- Those inhabiting ecological refugia or other specialized or unique habitats (BLM 2000)

There are a number of special status plant and wildlife species that are known from the Planning Area. Species that are listed by the federal or state government as threatened or endangered or are listed as sensitive by BLM are presented in Table 3-6. This table also provides an assessment regarding occurrence on BLM-administered lands within the Planning Area. Reports of special status species can be found in Appendix H.

TABLE 3-6
SPECIAL STATUS SPECIES

Common Name	Scientific Name	Federal Status	State Status	BLM Status	Occurrence Known or Suspected
Plant Species					
Peirson's milk-vetch	*Astragalus magdalenae* var. *peirsonii*	FT			Known
Wiggin's croton	*Croton wigginsii*		SR		Known
Algodones Dunes sunflower	*Helianthus niveus* spp. *tephrodes*		SE		Known
Munz's cholla	*Opuntia munzii*			Sensitive	Known
Giant Spanish needle	*Palafoxia arida* var. *gigantea*			Sensitive	Known
Sand food	*Pholisma sonorae*			Sensitive	Known
Orocopia sage	*Salvia greatei*			Sensitive	Suspected
Wildlife Species					
Mammals					
Spotted bat	*Euderma maculatum*			Sensitive	Suspected
California leaf-nosed bat	*Macrotus californicus*			Sensitive	Suspected
Cave myotis	*Myotis velifer*			Sensitive	Suspected
Townsend's big-eared bat	*Plecotus townsendii*			Sensitive	Known
Birds					
Burrowing owl	*Athene cunicularia*			Sensitive	Known
Gila Woodpecker	*Melanerpes uropygialis*		SE	Sensitive	Known
LeConte's thrasher	*Toxostoma lecontei*			Sensitive	Known
Arizona Bell's Vireo	*Vireo bellii arizonae*		SE		Known
Amphibians					
Lowland leopard frog	*Rana yavapaiensis*			Sensitive	Suspected
Couch's spadefoot toad	*Scaphiopus couchi*			Sensitive	Known
Reptiles					
Mojave Desert tortoise	*Gopherus agassizii*	FT	ST		Known
Flat-tailed horned lizard	*Phrynosoma mcallii*			Sensitive	Known
Colorado Desert fringe-toed lizard	*Uma notata*			Sensitive	Known

FT = federally listed threatened
SE = state-listed endangered
SR = state-listed rare
ST = state-listed threatened

3.7.1 Federally Listed Species

The USFWS has identified two federally listed species as occurring within the Planning Area: PMV and Mojave Desert tortoise (USFWS 2009). Accounts are presented below for the two listed species identified in this section as possibly occurring in the Planning Area. Pertinent aspects of the status, distribution, life history, and habitat requirements of these species have been extracted from a variety of sources, including the proposed and final rules to list these species; the proposed and final rules to designate critical habitat, recovery plans, scientific journal articles, and other relevant documents. Records of occurrence for the Planning Area are based on BLM file documents and field notes; published literature sources, and technical reports.

3.7.1.1 Peirson's Milk-vetch (*Astragalus magdalenae* var. *peirsonii*)

3.7.1.1.1 Status

PMV was proposed as endangered by the USFWS in 1992 and listed as threatened in 1998 (USFWS 1998). It is also recognized as endangered by the State of California and as a special status species by the BLM. The CNPS lists the PMV as a category 1B (rare, threatened, or endangered in California and elsewhere throughout its range (Tibor 2001). Critical habitat for this species was designated by USFWS on February 14, 2008 (USFWS 2008a).

3.7.1.1.2 Life History

A short-lived perennial plant of the pea family (Fabaceae), PMV may reach 8 to 30 inches in height and develop tap roots that penetrate deeply to the moister sand and anchor the plants in the shifting sand dunes (USFWS 2008a). The stems and leaves are pubescent, and the leaves are 2 to 6 inches long. The flowers are dull purple and are arranged in 10 to 17 flowered racemes. The resulting seed pods are 0.8 to 1.5 inches long and are inflated with a triangular beak (Bowers 1996).

Based on the current understanding of the PMV life history, sufficient rain in conjunction with cool temperatures and wetter-than-average fall weather appear to trigger germinating events (USFWS 2008a). This species likely depends on the production of seeds in wetter years and the persistence of the seed bank from previous years to survive until appropriate conditions for germination occur again (USFWS 2008a).

This species is able to become reproductive in a single season. It generally completes seed production by June. By July, the plant has dropped many of its leaflets and some entire leaves. This condition may persist from July to October. Seedlings may be present in December, although not in great numbers. Seedlings that germinate by November or

December may reach the flowering or fruiting stage by March (Romspert and Burk 1979).

Seeds of the PMV are the largest of any North American milk-vetch species (Barneby 1964). Within this genus, the large seeds are thought to be better adapted to active dunes than small seeds. This may be due to the larger food reserves enabling them to emerge even when deeply buried (Bowers 1996). Harper et al. (1970), however, noted that there is a trade-off between seed size and seed numbers such that large-seeded plants typically produce fewer seeds. PMV seeds are transported within inflated pods that are dispersed by winds across the dunes where they may come to rest within vegetation or depressions. Many seeds fall prey to members of the seed beetle family, Bruchidae, which contributes to a high mortality of seeds and reduced seed crop for this species (Romspert and Burk 1979).

PMV habitat consists of sandy depressions at the base of high dunes and lower established dunes. This species does not extend many lateral roots and, therefore, is more vulnerable if the main stem is broken. The vulnerability of the adult plants in conjunction with the period of seedling establishment during the cooler months, which coincides with the higher usage of the dunes by OHVs, makes this species sensitive to impacts (Romspert and Burk 1979).

3.7.1.1.3 Distribution and Occurrence within the Planning Area

An obligate psammophyte, PMV occurs on bowls, swales, and slopes of intact, active, windblown sand dunes. This species is currently known to occur within the dunes of the Planning Area as well as the northeastern Estado de Baja California and Gran Desierto of northwestern Sonora, Mexico (USFWS 2008a). Although it has been reported from Borrego Valley, San Diego County, California, it has not been observed there for several decades (Tibor 2001).

Within the Planning Area, this species is restricted to about 53,000 acres in a narrow band running 40 miles northwest to southeast along the western portion of the ISD. Plants are generally scattered throughout the dune complex with a higher abundance along the central and western aspect of the dunes. The sand dunes within the Planning Area are estimated to support between 75 and 80 percent of all of the world's known colonies of this species (USFWS 1998).

Ongoing monitoring has indicated that the distribution and abundance of PMV is closely tied to precipitation. Plants are most abundant in years with the highest rainfall and least abundant in years with the lowest rainfall. Response of PMV was similar in areas both open and closed to OHV use (Willoughby 2001).

3.7.1.1.4 Critical Habitat

Surveys for the PMV have been conducted repeatedly since about 1977. The BLM conducted annual surveys for this species from 1997 to 2000 and from 2004 to 2007. Based on data collected during these surveys and other relevant information, the USFWS designated critical habitat for the PMV on August 4, 2004, comprising a total of 21,863 acres (USFWS 2004). Critical habitat was revised and re-designated on February 14, 2008 (USFWS 2008a) and now includes 12,105 acres in three units. All areas designated as critical habitat are currently occupied, within the species geographical range, and contain sufficient primary constituent elements to support at least one life history function. The USFWS determined that the primary constituent elements for the PMV are:

- West and/or northwest-facing sides of bowls, swales, and slopes consisting of Rositas fine sands within intact, active sand dune systems (defined as sand areas that are subject to sand-moving winds) in the existing range of the species that provide space needed for individual and population growth, including sites for germination, reproduction, seed dispersal, seed bank, and pollination

- The associated co-adapted psammophytic scrub plant community characterized by *Croton wigginsii*, *Erigonum deserticola*, *Helianthus niveus* spp. *tephrodes*, *Palafoxia arida* var. *gigantean*, *Pholisma sonorae*, *Tiquilia plicata*, *Petalonyx thurberi*, and *Panicum urvilleanum* that provides habitat for insect pollinators, particularly the white-faced digger bee (*Habropoda pallida*), required for reproduction

- Areas within intact, active sand dune systems between occupied bowls, swales, and slopes that allow for pollinator movement and wind dispersal of fruit and seeds

Map 3-2 depicts designated PMV critical habitat within the Planning Area.

3.7.1.1.5 Threats

OHV recreation and associated recreational development have been described as the primary threats to PMV through destruction of individual plants and habitat (USFWS 2008a). OHV recreation can impact PMV habitat by:

1. Disrupting the natural processes that support dune formation, movement, and structure, which could disrupt the available habitat needed for individual and population growth;

2. Causing the collapse of dune faces and ridges, which could result in burial of the seed bank;

3. Disturbing surface sand, thereby decreasing soil moisture needed for establishment of individual plants and population growth, and

4. Degrading the psammophytic scrub plant community that provides habitat for pollinators required for reproduction.

3.7.1.2 Mojave Desert Tortoise (*Gopherus agassizii*)

3.7.1.2.1 Status

The Mojave population of the desert tortoise was emergency listed by the USFWS as an endangered species in 1989 and federally listed as threatened in 1990 (USFWS 1990). It is also recognized as threatened by the State of California and as a special status species by the BLM. The BLM has completed several management plans including the West Mojave Management Plan (WEMO; BLM 2006c), Northern and Eastern Mojave Desert Management Plan (NEMO; BLM 2002a), and NECO (BLM 2002b). An important focus of these plans was the management of the Mojave population of the desert tortoise and its habitat on BLM-administered lands in California. A final recovery plan was completed by the USFWS in 1994 and a draft revised recovery plan was released in 2008 (USFWS 1994a and 2008b). Critical habitat for the Mojave population was also designated by the USFWS in 1994 (USFWS 1994b). The Chuckwalla Bench Critical Habitat Unit for this species is located approximately 20 miles northeast of the Planning Area.

3.7.1.2.2 Life History

The desert tortoise is a large herbivorous terrestrial reptile. It has a high domed shell that may reach a length of 15 inches or more. This species has stocky, elephant-like limbs and a short tail. The carapace (upper shell) is brown; and the plastron (lower shell) is yellow in color, both exhibiting prominent growth lines. Adult males can be distinguished from females by the concavity in their plastron. Adult males also have larger chin glands and a longer tail and gular horn than females (Stebbins 1985).

The adult desert tortoise is active from mid-March or April until about November. During the winter months, tortoises are dormant in underground burrows (Luckenbach 1982; Zimmerman et al. 1994). Desert tortoises will congregate in winter dens during colder weather then spread out to nearby areas during moderate weather in the spring and fall. They retreat into short individual burrows or under shrubs during the extreme heat of the summer (Woodbury and Hardy 1940). During the active period, desert tortoises may establish home ranges of approximately one square mile. Tortoises feed on a wide variety of herbaceous plants, including cacti, grasses, and annual flowering plants (USFWS 1994a).

Adult desert tortoises reach sexual maturity at 15 to 20 years of age. Mating occurs in the spring (April and May) and the fall (August and September) with nesting and egg laying occurring from May to July (Rostral et al. 1994). The female tortoise lays her eggs in a hole approximately three to four inches deep that is dug near the mouth of a burrow.

Following egg laying the female covers the eggs with soil (Woodbury and Hardy 1940). Clutch size ranges from two to 14 eggs with an average of five to six eggs (Luckenbach 1982). Desert tortoise eggs typically hatch from August through October. These hatchlings are provided a food source in the form of an egg yolk that is assimilated into the underside of the shell. This yolk sac will sustain the hatchling for up to six months. The hatchling desert tortoise will go into hibernation in the late fall, but can be active on warm sunny or rainy days (Luckenbach 1982).

3.7.1.2.3 Distribution and Occurrence within the Planning Area

The desert tortoise is widely distributed throughout the Mojave, Sonoran, and Colorado deserts. It occupies arid regions from southern Nevada and extreme southwestern Utah to northern Sinaloa, Mexico; southwestern Arizona west to the Mojave Desert and the eastern side of the Salton Basin, California (Stebbins 1985).

In the Mojave region, desert tortoises are primarily associated with flats and bajadas with soils ranging from sand to sandy-gravel, but firm enough for the tortoise to construct burrows (USFWS 1994a). In California, the desert tortoise is most commonly found in association with creosote bush scrub with intershrub space for growth of herbaceous plants. However, it may also occur in saltbush scrub, desert wash, desert scrub, and Joshua tree woodlands. The desert tortoise is found from below sea level to elevations of 5,000 feet in California. The most favorable habitats occur at elevations of approximately 1,000 to 3,000 feet (USFWS 1994a).

Desert tortoise habitat in the general vicinity of the Planning Area has been degraded and fragmented by OHV and camping recreation, agricultural development, utility corridors, and the construction and maintenance of the UPRR and All-American Canal. Along the eastern portion of the Planning Area, the creosote bush scrub habitat and the desert washes north and south of SR-78 provide marginal suitable habitat for the desert tortoise. BLM and USBP officials have observed desert tortoises in the general vicinity of and crossing Vista Mine and Ted Kipf roads. To date, limited surveys for desert tortoise have been conducted within the Planning Area. Limited desert tortoise distribution and abundance data currently exist. Map 3-3 shows the tortoise habitat within and adjacent to the Planning Area.

3.7.1.2.4 Threats

The decline in the desert tortoise population is attributed primarily to habitat loss, degradation, and fragmentation resulting from increased human population and urbanization in the desert and arid regions of the southwestern US. The increase in urbanization, collection of tortoises for pets, overgrazing, landfills, subsidized predation (including predation by ravens), highway mortality, vandalism, agriculture, fire, drought, and OHV recreation all have contributed to the decline of the tortoise in the wild (Luckenbach 1982; USFWS 1990). Another important reason for the decline of the

desert tortoise is the introduction of an upper respiratory tract disease into many of the wild populations (Berry 1986). This disease was thought to have been introduced through the illegal release of captive desert tortoises into the wild (USFWS 1994a).

Raven monitoring was conducted for the Mesquite Regional Landfill as part of compliance with the USFWS Biological Opinion terms and conditions for the Mojave desert tortoise found within the study area. Monitoring for ravens was to be conducted two years prior to landfill operation and at least one of those years prior to disturbance from construction. The Mesquite Regional Landfill monitoring study began in 1994 and data was collected for 2 years; however, these studies preceded landfill construction by more than 10 years. Monitoring baseline studies were re-initiated in 2005 and 2006. Monitoring included 21 sites surrounding the landfill, with seven monitoring sites located within or immediately adjacent to the ISD Planning Area (monitoring sites 3, 4, 5, 6, 7, 8, and 9). Results of monitoring indicated that raven observations were low in the study area in all years compared to regional increases. This data, along with a variation in observations, indicated that raven populations may not be well established in the immediate vicinity of the Mesquite Regional Landfill. Overall, ravens were more often observed in the fall than in the spring, this may be due to spring brooding occurring outside the study area and the increased presence of juveniles in the fall. No nests were found within the study area during monitoring surveys. Based on data gathered in 1994 and 1995, it was hypothesized that most ravens in the immediate study area are transients, not residents. This trend will likely change as the Mesquite Regional Landfill becomes operational and landfill waste will provide a dependable year-round food source, increasing the likelihood that ravens will become more common residents in the area. Campgrounds within the ISD Planning Area included in the Mesquite Regional Landfill monitoring surveys showed pre-existing elevated raven occurrences in 2007–2008, which are likely to continue (EDAW/AECOM 2009).

3.7.2 State-listed Species

3.7.2.1 Algodones Dunes Sunflower (*Helianthus niveus* spp. *Tephrodes*)

3.7.2.1.1 Status

The Algodones Dunes sunflower was listed as endangered by the State of California in November 1979. It is recognized by the CNPS as 1B (rare, threatened, or endangered in California and elsewhere throughout their range).

3.7.2.1.2 Life History

The Algodones Dunes sunflower (also commonly referred to as the Algodones sunflower and the silver-leaved dune sunflower) is a perennial herb and native to California. A

dense covering of fine hairs protects the plant from excess light and heat (a common dune plant adaptation) and gives the leaves a silvery appearance (BLM 1987). The Algodones Dunes sunflower is a relatively long-lived species; once established, it is able to survive periods of below-average precipitation. Felger (2000) reported that the species is 1.5 to over 3 feet tall. Like PMV, Algodones Dunes sunflower has relatively large seeds and is fast growing.

3.7.2.1.3 Distribution and Occurrence within the Planning Area

The Algodones Dunes sunflower tends to grow in areas with active sand movement, such as on the lower portion of dune slip faces. The Algodones Dunes sunflower has been observed thriving where no other vegetation occurs on actively moving sand, but it also can be frequently associated with swales where concentrations of other vegetation are found (Thomas Olsen and Associates, Inc. [TOA] 2001).

3.7.2.1.4 Threats

Within the Planning Area, the primary threat to Algodones Dunes sunflower is destruction of individual plants and habitat by OHV recreation and associated recreational development.

3.7.2.2 Wiggins' Croton (*Croton wigginsii*)

3.7.2.2.1 Status

Wiggins' croton was recognized by the State of California as rare in January 1982 (CNDDB 2009b). It is also recognized by the CNPS as Category 2 (rare, threatened, or endangered in California, but common elsewhere in their range).

3.7.2.2.2 Life History

Wiggins' croton is a many-branched, woody perennial, which grows from 20 to 30 inches high.

3.7.2.2.3 Distribution and Occurrence within the Plan Area

This species is native to California, Arizona, and Baja California and Sonora, Mexico. Within the Planning Area, it is found within psammophytic scrub habitat and prefers stabilized and partially stabilized desert dune systems (CNDDB 2009b). It most often grows on south or southeast slopes of basins, and sometimes grows farther toward the floor of the basin (TOA 2001).

3.7.2.2.4 Threats

Within the Planning Area, the primary threat to Wiggins' croton is destruction of individual plants and habitat by OHV recreation and associated recreational development.

3.7.2.3 Gila Woodpecker (*Melanerpes uropygialis*)

3.7.2.3.1 Status

The Gila woodpecker is listed as endangered by the State of California. It is also recognized by the BLM as a special-status species.

3.7.2.3.2 Life History

The Gila woodpecker is a "zebra-backed" woodpecker and the males have a red cap on top of their head. The head and under parts are typically gray-brown. The Gila woodpecker feeds mainly on insects, mistletoe berries, cactus fruits, corn, and occasionally contents of galls on cottonwood leaves, bird eggs, acorns, and cactus pulp. The species breeds from April through July, with peak activity in April and May. They are cavity nesters and may use abandoned owl cavities (CDFG 2001).

3.7.2.3.3 Distribution and Occurrence within the Plan Area

The Gila woodpecker's preferred habitat is mesquite-dominated microphyll woodlands and desert dry washes. They also occupy orchard–vineyards (specifically, date palm groves) and urban areas (shade trees). This species was formerly prolific throughout the Imperial Valley. Due to habitat degradation, most of the current populations are concentrated in the Brawley, California, area (CDFG 2001). Brawley is located approximately 20 miles west of the Planning Area. Within the Planning Area, this species may occur in the microphyll woodland habitat on the eastern side of the dunes. The BLM has conducted surveys (point counts) for this species within the Planning Area during the last four seasons. However, this survey data have not provided sufficient information to determine distribution and abundance of this species.

3.7.2.3.4 Threats

Loss, fragmentation, or degradation of riparian woodland to development has displaced the woodpecker from some areas. Additionally, European starlings are competing with this species for nest cavities (CDFG 2001).

3.7.2.4 Arizona Bell's Vireo (*Vireo bellii arizonae*)

3.7.2.4.1 Status

The Arizona Bell's vireo was listed by the State of California as endangered in 1988.

3.7.2.4.2 Life History

The Arizona Bell's vireo is a small, active bird. They are typically found in lowland riparian areas, with willows, mesquite, and seepwillows. They prefer dense, low, shrubby vegetation in riparian areas. This vireo is an insectivore, feeding on caterpillars, beetles, bees, wasps, and spiders. They build their nests in low dense vegetation usually less than 5 feet above the ground. Nests are often located near openings within thickets and near water (Arizona Game and Fish Department 2002).

In California, the Arizona bell's vireo is a summer resident of willow and mesquite riparian habitat of the Sonoran Desert (the low desert area of southeastern California).

3.7.2.4.3 Distribution and Occurrence within the Plan Area

The lower Colorado River historically provided the vast majority of habitat for this species in California. This species may be found in the microphyll woodlands and along the canal-influenced vegetation within the Planning Area.

3.7.2.4.4 Threats

In California, the Arizona bell's vireo is found primarily within remnants of cottonwood-willow and mesquite riparian habitats. In these areas, there are two primary threats to this species, the loss of habitat through human and human-induced activities, and nest parasitism by brown-headed cowbirds.

3.7.3 BLM Sensitive Species

3.7.3.1 Munz's Cholla (*Opuntia munzii)*

3.7.3.1.1 Status

Munz's cholla is listed by the BLM as a sensitive plant species and by the CNPS as a Category 1B (rare, threatened or endangered species in California).

3.7.3.1.2 Life History

Munz's cholla is a shrub- to tree-like cactus from 2 to 6 feet in height and almost as wide. This species is native to California and is endemic (limited) to the state alone (CalFlora 2009). This cholla is found in dry, gravelly, or sandy places in creosote bush

scrub vegetation communities. They are typically found in elevations from 480 to 1,900 feet. Flowers usually bloom in May (BLM 2009a). This cholla only reproduces vegetatively.

3.7.3.1.3 Distribution and Occurrence within the Planning Area

Munz's cholla is known to occur within Imperial County and portions of Riverside County. This species is most likely to occur within the creosote scrub vegetation community surrounding the dunes system within the Planning Area.

3.7.3.1.4 Threats

Some occurrences of Munz's cholla are threatened by military activities with the species range (CalFlora 2009). Within the Planning Area, the primary threat to Munz's cholla is destruction of individual plants and habitat by OHV recreation and associated recreational development.

3.7.3.2 Giant Spanish Needle (*Palafoxia arida* var. *gigantea*)

3.7.3.2.1 Status

The giant Spanish needle is recognized by the BLM as a sensitive species. The CNPS lists the giant Spanish needle as Category 1B (rare, threatened, or endangered in California and elsewhere throughout their range).

3.7.3.2.2 Life History

Giant Spanish needle is a fast-growing annual found on active sand dunes. This dune species tends towards gigantism, with larger and more robust plants than related non-dune taxa (Felger 2000). Felger (2000) reports it growing from 2 to 5 feet tall.

3.7.3.2.3 Distribution and Occurrence within the Planning Area

This species is native to California and is found from California to Arizona and in Sonora, Mexico (BLM 1987; TOA 2001). Once established, giant Spanish needle is able to survive periods of below-average precipitation. Abundance of giant Spanish needle in a given year is almost unrelated to the precipitation of the immediately preceding growing season (BLM 2001b). As a short-lived flowering perennial, it frequently occurs within the Planning Area in sites with PMV and croton (BLM 2001b; TOA 2001). Most occurrences of giant Spanish needle have been found south of I-8 (TOA 2001).

3.7.3.2.4 Threats

Within the Planning Area, the primary threat to giant Spanish needle is destruction of individual plants and habitat by OHV recreation and associated recreational development.

3.7.3.3 Sand Food (*Pholisma sonorae*)

3.7.3.3.1 Status

The sand food is recognized by the BLM as a sensitive species. The CNPS lists this species as Category 1B.2 (rare, threatened, or endangered in California and elsewhere throughout their range).

3.7.3.3.2 Life History

This parasitic, perennial herb is native to California. As a root parasite, most of the plant is buried in the sand and only the flower heads are visible aboveground. This species is parasitic on *Tiquilia plicata*, *Eriogonum deserticola* (Armstrong 1980) and possibly also on *Croton wigginsii* (Westec 1977). The point of connection with the host plant may be more than a yard below the surface. Sand food stems are succulent and store copious amounts of water. During times of drought, it may provide moisture to the host plant. It is visible aboveground for only a short time. Each spring, a flowering stem is sent to the surface by the sand food, which produces a disk-shaped inflorescence with hundreds of tiny pink flowers. Sand deflation does not seem to affect its flowering (TOA 2001).

3.7.3.3.3 Distribution and Occurrence within the Planning Area

The primary habitat of sand food is open, sandy flats and sandy or stony desert washes within creosote bush scrub (CNDDB 2001). Sand food was found at scattered locations, most commonly in the Gecko Road area and an area north of I-8. It was generally found in somewhat flat areas, but its appearance was difficult to predict, as there were many sites with hosts but without sand food (TOA 2001).

3.7.3.3.4 Threats

Within the Planning Area, the primary threat to sand food is destruction of individual plants and habitat by OHV recreation and associated recreational development. Additionally, impacts to host plants would have a negative effect on the sand food population (BLM 2001b).

3.7.3.4 Orocopia Sage (*Salvia greatae*)

3.7.3.4.1 Status

This species is recognized by the BLM as a sensitive species. The CNPS lists this species as Category 1B.3 (rare, threatened, or endangered in California and elsewhere throughout their range).

3.7.3.4.2 Life History

Orocopia sage is a dicot shrub that is native to California (endemic). This species is typically found in Mojave and Sonoran desert scrub communities. The preferred habitat for this sage is in gravelly or rocky soils on broad bajadas or fans, often adjacent to desert washes, or on rocky benches elevated above the floodplain of a wash (Coachella Valley Multi-Species Habitat Conservation Plan 2009). The blooming period for this sage is usually March and April.

Though Orocopia sage is patchy in its distribution, where it occurs it is typically one of the dominant members of the vegetation. Plants may be 3 to 4 feet tall and usually form dense, rounded clumps, sometimes as large as 4 or 5 feet in diameter. Multiple branching from near ground level results in a very bushy habitat (Coachella Valley Multi-Species Habitat Conservation Plan 2009).

3.7.3.4.3 Distribution and Occurrence within the Planning Area

This sage is endemic to the Orocopia Mountains, Mecca Hills, and Chocolate Mountains. This species likely occurs near the eastern boundary of the Planning Area, west of the Chocolate Mountains (Coachella Valley Multi-Species Habitat Conservation Plan 2009).

3.7.3.4.4 Threats

Threats to this species are few in that its habitat is largely protected within the Mecca Hills, Orocopia Mountains, and Chuckwalla Mountains WAs, established by the 1994 Desert Protection Act. There may be some threat from illegal OHV recreation as well.

3.7.3.5 Spotted Bat

3.7.3.5.1 Status

The spotted bat is recognized by the BLM as a sensitive species.

3.7.3.5.2 Life History

Spotted bats have three large white spots on their backs that show up clearly against their black bodies. They also have very large ears that are almost 2 inches in length.

Spotted bats are among the rarest in North America. As a result, little is known about the life history and habits of spotted bats. Few roosts of this species have been found, but rock crevices are thought to be commonly used. This species likely feeds almost entirely on moths, supplementing their diet with other insects. The reproduction cycle of spotted bats has not been thoroughly studied, but biologists have determined that pregnant females give birth to one young in June (BLM 2009a).

3.7.3.5.3 Distribution and Occurrence within the Planning Area

This species likely occurs in the Cargo Muchacho Mountains east of the Planning Area, it may also occur in the Chocolate Mountains. Although no roosting habitat for the spotted bat exists within the Planning Area, there is foraging habitat within and adjacent to the Planning Area. To date, the BLM has not conducted any surveys for this species within the Planning Area. Therefore, distribution and abundance data do not currently exist.

3.7.3.5.4 Threats

The decline of spotted bats is primarily due to human interference, such as habitat destruction and alteration. Bats live in natural as well as in human-made structures such as caves, bridges, and abandoned mines. Vandalism and destruction of these structures exclude or harm bats using them. Activities such as building bonfires under bridges can also cause bats to die from smoke inhalation. Many bridges and mines also contain maternity dens, where human disturbance causes detrimental impacts on adults as well as young (BLM 2009a).

3.7.3.6 California Leaf-nosed Bat

3.7.3.6.1 Status

The California leaf-nosed bat is recognized by the BLM as a sensitive species.

3.7.3.6.2 Life History

California leaf-nosed bats are typically found in desert scrub vegetation communities of southern California where it is closely associated with mine shafts and tunnels. This bat is a medium-sized species distinguished by its combination of large ears and vertical "leaf-like" projection on its nose. Leaf-nosed bats forage primarily along microphyll washes for their insect prey, which includes grasshoppers, beetles and moths. Most foraging activity for this species seems to occur within about a 1-mile radius of the roost site, with forays of up to a 5-mile radius during warm months. Adult bats mate in the autumn months. The young are born in May or June. A female bat gives birth to a single offspring (BLM 2009a).

3.7.3.6.3 Distribution and Occurrence within the Planning Area

California leaf-nosed bats have been captured during studies in the Cargo Muchacho Mountains, east of the Planning Area. Although no roosting habitat for the California leaf-nosed bat exists within the Planning Area, there is foraging habitat within and adjacent to the Planning Area. To date, the BLM has not conducted any surveys for this species within the Planning Area. Therefore, distribution and abundance data do not currently exist.

3.7.3.6.4 Threats

The decline of California leaf-nosed bats is primarily due to human interference, such as habitat destruction and alteration. Bats live in natural as well as in human-made structures such as caves, bridges, tunnels, and abandoned mines. Vandalism and destruction of these structures exclude or harm bats using them. Many bridges and mines also contain maternity dens, where human disturbance causes detrimental impacts on adults as well as young (BLM 2009a).

3.7.3.7 Cave Myotis

3.7.3.7.1 Status

The cave myotis is recognized by the BLM as a sensitive species.

3.7.3.7.2 Life History

The cave myotis is a large bat identified by a wing membrane that extends to its toes. Roost sites include caves, tunnels, mine shafts, and bridges. Within California, this species is found primarily in the extreme southeastern portion of the state. Cave myotis live in colonies of 2,000 to 5,000 individuals within caves. These bats mate in the fall, but because of delayed implantation the females do not become pregnant until spring. In June or July females give birth to one pup. The young begin to forage on their own at about one month old and are weaned shortly after that (BLM 2009a).

3.7.3.7.3 Distribution and Occurrence within the Planning Area

California distribution and occurrence records for this species include mountain ranges in southeastern California. Although no roosting habitat for the cave myotis exists within the Planning Area, there is foraging habitat within and adjacent to the Planning Area. To date, the BLM has not conducted any surveys for this species within the Planning Area. Therefore, distribution and abundance data do not currently exist.

3.7.3.7.4 Threats

The decline of cave myotis bats is primarily due to human interference, such as habitat destruction and alteration. Bats live in natural as well as in human-made structures such as caves, bridges, tunnels, and abandoned mines. Vandalism and destruction of these structures exclude or harm bats using them (BLM 2009a).

3.7.3.8 Townsend's Big-eared Bat

3.7.3.8.1 Status

The Townsend's big-eared bat is recognized by the BLM as a sensitive species.

3.7.3.8.2 Life History

The Townsend's big-eared bat is a medium-sized bat with extremely large ears joined across the forehead. Known roosting sites in California include caves, mine tunnels, and abandoned buildings. They hibernate during the winter months, frequently waking up to move locations, and feed almost entirely on moths. The rest of their diet consists of beetles and a variety of fly species. This species feeds relatively late at night, emerging from its roost site about 45 minutes after sunset (BLM 2009a).

During the summer months females and young can be found in maternity colonies, usually constructed in caves and buildings. In California, there may be up to 200 individuals in a single colony. The females arrive at the colony site in March and April and they remain there until September. Females give birth to one young during the month of June. The pups are able to fly at three weeks of age and they are weaned by the time they are five weeks old (BLM 2009a).

3.7.3.8.3 Distribution and Occurrence within the Planning Area

Townsend's big-eared bats are known to forage within desert scrub vegetation communities adjacent to the Planning Area. No roosting habitat for the Townsend's big eared bat likely exists within the Planning Area. To date, the BLM has not conducted any surveys for this species within the Planning Area. Therefore, distribution and abundance data do not currently exist.

3.7.3.8.4 Threats

The Townsend's big-eared bat is extremely intolerant of disturbance, even a single human visit into a roosting site may cause these bats to abandon the site (BLM 2009a). The decline of this bat species is primarily due to human interference, such as habitat destruction and alteration.

3.7.3.9 Western Burrowing Owl (*Athene cunicularia*)

3.7.3.9.1 Status

The western burrowing owl is recognized by the State of California as a species of special concern and as a sensitive species by the BLM.

3.7.3.9.2 Life History

This species of owl is identified by its barred and spotted plumage, white chin stripe, round head, and stubby tail. The western burrowing owl is a diurnal (daylight active) species that is non-migratory in this portion of its range. Burrowing owls are opportunistic feeders, preying upon arthropods, small mammals, birds, and sometimes reptiles and amphibians. This species breeds from late April through July in the Imperial Valley. Burrowing owls are subterranean nesters, typically found using burrows made by small mammals such as ground squirrels and badgers. The burrowing owl commonly perches on fence posts or on top of mounds outside its burrow (BLM 2009a).

Found throughout much of the western US, this species inhabits open, dry grasslands, deserts, agricultural areas, and scrublands characterized by low growing vegetation. These owls also occupy open areas of airports, golf courses, and vacant urban lots. They are generally found at elevations ranging from 200 feet below sea level to 9,000 feet.

3.7.3.9.3 Distribution and Occurrence within the Planning Area

Throughout the Imperial Valley, burrowing owls are frequently found along unlined agricultural canals and drainages. This species is typically found in low densities in desert habitats, but can occur in much higher densities near agricultural lands where rodent and insect prey is more abundant. There are no known records of this species within the Planning Area, although there have been anecdotal sightings of burrowing owl in the microphyll woodlands (E. Dreyfuss, pers. comm.). The psammophytic habitat is not suitable for this species. However, the creosote bush scrub and microphyll woodland habitats within the eastern portion of the Planning Area are suitable for burrowing owls. The BLM has conducted surveys (point counts) for this species within the Planning Area during the last four seasons. However, the survey data have not provided sufficient information to determine distribution and abundance of this species.

3.7.3.9.4 Threats

Threats to this species include habitat degradation, disturbance to nesting and roosting sites, and pesticides and other contaminants/toxins. Agricultural practices that reduce the ground squirrel population result in a reduction of the available nesting and roosting sites for the burrowing owl as well as reduce prey species available.

3.7.3.10 LeConte's Thrasher (*Toxostoma lecontei*)

3.7.3.10.1 Status

The LeConte's thrasher is recognized by the State of California as a species of special concern and as a sensitive species by the BLM.

3.7.3.10.2 Life History

The LeConte's thrasher is pale gray-brown in color, with a long tail, and recurved bill. They typically run before taking flight. LeConte's thrashers feed on seeds, insects, small lizards, and other small vertebrates. This species requires areas with an accumulated leaf litter that serves as cover for its primarily arthropod prey. Only during breeding activities, when males sing from exposed perches, are they relatively easy to detect.

LeConte's thrasher is a desert resident of areas with sparse desert scrub, alkali desert scrub, and desert succulent scrub habitats with open desert washes (CNDDB 2001). It is found year-round throughout much of the Mojave and Colorado deserts of California. Population densities of this species are among the lowest of passerine (perching) birds, estimated at less than five birds per square mile in optimum habitat.

3.7.3.10.3 Distribution and Occurrence within the Planning Area

Within the Planning Area, the creosote bush scrub vegetation community and the desert washes on the eastern side may provide suitable habitat for the LeConte's thrasher. The BLM has conducted surveys (point counts) for this species within the Planning Area during the last four seasons. However, this survey data have not provided sufficient information to determine distribution and abundance of this species.

3.7.3.10.4 Threats

OHV recreation and other human disturbance are considered disruptive to this species, especially during the breeding season (late January to early June). OHV recreation can crush vegetation and destroy the underlying litter and soil surface thereby precluding heavily used sites from further use by this species (Sheppard 1996).

3.7.3.11 Lowland Leopard Frog

3.7.3.11.1 Status

The lowland leopard frog is recognized by the State of California as a species of special concern and as a sensitive species by the BLM.

3.7.3.11.2 Life History

The lowland leopard frog is about 2 to 3 inches long and is a tan, brown, light green to bright green color. This frog appears to stay close to water, seeking shelter in streamside vegetation. Throughout most of its range, the lowland leopard frog is found in streams, riverside channels, springs, ponds, and stock ponds in desert, grassland, and woodland. Lowland leopard frogs most likely forage on a variety of invertebrates. Throughout most of its range, mating and egg-laying occurs from January to April, with possibly two breeding episodes. Eggs are laid in the water (California Reptiles and Amphibians 2009).

3.7.3.11.3 Distribution and Occurrence within the Planning Area

In California, this frog has historically ranged from San Felipe Creek, Imperial County east to the lower Colorado River Valley. This species is native to the lower Colorado River and natural overflow lakes and tributary streams in the Imperial Valley. Isolated populations may remain in the Imperial Valley and the San Felipe Creek drainage (California Reptiles and Amphibians 2009). To date, the BLM has not conducted any surveys for this species within the Planning Area. Therefore, distribution and abundance data do not currently exist.

3.7.3.11.4 Threats

The spread of introduced *Rana berlandieri*, predatory crayfish, fish, bullfrogs, habitat alteration by agriculture, grazing, development, and building of reservoirs have all been mentioned as possible contributors to the decline of the lowland leopard frog.

3.7.3.12 Couch's Spadefoot Toad (*Scaphiopus couchi*)

3.7.3.12.1 Status

Couch's spadefoot toad is recognized by the State of California as a species of special concern and as a sensitive species by the BLM.

3.7.3.12.2 Life History

The Couch's spadefoot toad is distinguished from true toads by its cat-like eyes, single sharp-edged black spade on its hind foot, teeth in the upper jaw, and rather smooth skin. The pupils of this species are vertical in bright light and round at night. Couch's spadefoot toad is greenish yellow to brownish yellow with an irregular network of dark blotches dorsally and generally whitish ventrally. Males generally have a dusky throat, dark nuptial pads on the innermost front toes, and are often more greenish than the females. Their voice is a plaintive cry or groan, declining in pitch like the anxious bleat of a sheep (Stebbins 1985).

They are generally active at night during spring and early summer rains and can be found in temporary desert rain pools with an insect food base available. Breeding is primarily from May through September during rainfall periods. They require friable soil for burrowing where they typically spend up to 11 months underground until sufficient rainfall has occurred. Couch's spadefoot toad has historically been observed in the northeast portion of the Planning Area after large rain events.

The Couch's spadefoot toad occupies a variety of habitat types, including desert dry wash woodland, creosote bush scrub, desert riparian, palm oasis, desert succulent scrub, shortgrass plains, mesquite savannah, and alkali sink scrub.

3.7.3.12.3 Distribution and Occurrence within the Planning Area

In California, the Couch's spadefoot toad occurs within Imperial, Riverside, and San Bernardino counties between 500 and 3,000 feet elevation. Scattered populations are known between Amos and Ogilby on the eastern boundary of the Planning Area. This species may occur in the microphyll woodland, desert dry wash, and creosote bush scrub habitats in the eastern portion of the Planning Area. To date, the BLM has not conducted any surveys for this species within the Planning Area. Therefore, Couch's spadefoot toad distribution and abundance data do not currently exist.

3.7.3.12.4 Threats

No specific threats to Couch's spadefoot toad are known. Potential threats to this species include loss, fragmentation, or degradation of habitat.

3.7.3.13 Flat-tailed Horned Lizard (*Phrynosoma mcalli*)

3.7.3.13.1 Status

In California, the flat-tailed horned lizard was designated a sensitive species by the BLM in 1980. In 1988, a petition was submitted to the California Fish and Game Commission (CFGC) to list the species as endangered. In 1989, the commission voted against the proposed listing. In 1993, the USFWS published a proposed rule to list the flat-tailed horned lizard as a threatened species (USFWS 1993). In 2006, the USFWS withdrew the proposal to list the flat-tailed horned lizard (USFWS 2006). More recently, the USFWS has been instructed by a federal district court to reinstate the listing proposal for this species. Currently, the State of California and BLM recognize the flat-tailed horned lizard as a species of special concern and sensitive species, respectively, and as a candidate for federal listing.

3.7.3.13.2 Life History

The flat-tailed horned lizard has the typical flattened body shape of horned lizards. It is distinguished from other species in its genus by its dark dorsal stripe, lack of external openings, broad flat tail, and comparatively long spines on the head (Funk 1981). The flat-tailed horned lizard has two rows of fringed scales on each side of its body. The species has cryptic coloring, ranging from pale gray to light rust brown dorsally and white or cream ventrally with a prominent umbilical scar. The only apparent external difference between males and females is the presence of enlarged postanal scales in males. Maximum snout-vent length for the species is 3.3 inches (Muth and Fisher 1992).

Flat-tailed horned lizards escape extreme temperatures by digging shallow burrows in the loose sand. Adults are primarily inactive from mid-November to mid-February. Juvenile seasonal activity is often dependent on temperature fluctuations. Breeding activity takes place in the spring with young hatching in late July and September. The diet of horned lizards typically consists of greater than 95 percent native ant species, mostly large harvester ants (*Pogonomyrmex* spp.).

The lizard is known to inhabit sand dunes, sheets, and hummocks, as well as gravelly washes. The species is thought to be most abundant in creosote bush scrub vegetation communities. However, this species may also be found in desert scrub, desert wash, succulent shrub, alkali scrub, sparsely vegetated sandy flats, desert pavement, and rocky slopes. They are typically found in dry, hot areas of low elevation (less than 800 feet).

3.7.3.13.3 Distribution and Occurrence within the Planning Area

The flat-tailed horned lizard is found in the low deserts of southwestern Arizona, southeastern California, and adjacent portions of northwestern Sonora and northern Baja California, Mexico. In California, the flat-tailed horned lizard is restricted to desert washes and desert flats in central Riverside, eastern San Diego, and Imperial counties. The majority of the habitat for the species is in Imperial County (Turner et al. 1980).

Suitable habitat for the flat-tailed horned lizard is found in the eastern portion of the Planning Area from Ogilby Road extending south to the All-American Canal (Federal Energy Regulatory Commission [FERC] 2007). Monitoring conducted as part of the North Baja Pipeline Project in 2000 and 2001 detected flat-tailed horned lizard in this area (FERC 2007). Rado noted that sand sheets extending east from the sand dunes provide favorable habitat for about one mile northwards from the intersection of Ogilby Road and I-8 (Rado 1995).

The surveys conducted by the BLM in 1978, 1979, and 1980 reveal that the highest abundance of this species occurs southwest of the Planning Area in the East Mesa ACEC. Low abundance of this species was detected on the eastern and western

boundaries of the sand dunes, predominantly in the creosote bush scrub community. Although this species is known to occur in the central ISD SRMA, the habitat is considered to be marginal because of the lack of suitable soil structure required to support their predominant prey: harvester ants (BLM 2001c). The flat-tailed horned lizard management area within the East Mesa ACEC is shown in Map 3-4.

3.7.3.13.4 Threats

Human activities have resulted in the conversion of approximately 34 percent of the historic habitat of the flat-tailed horned lizard. The decline in the flat-tailed horned lizard population is primarily due to impacts from utility lines, roads, geothermal development, sand and gravel mining, OHV recreation, waste disposal sites, military activities, pesticide use, and USBP activities (Flat-tailed Horned Lizard Interagency Coordinating Committee 2003). The Argentine ant (*Linepithema humile*), an invasive species, was considered as a possible threat, but dismissed as such, since the climate at the dunes is too dry for Argentine ants to survive.

3.7.3.14 Colorado Desert Fringe-toed Lizard (*Uma notata*)

3.7.3.14.1 Status

The Colorado Desert fringe-toed lizard is a State of California species of special concern. It is also recognized by the BLM as a sensitive species.

3.7.3.14.2 Life History

The fringe-toed lizard is a flattened, sand-dwelling lizard with characteristic fringed toes. The species is cryptic in color ranging from a sand color dorsally and white or cream ventrally. It also has pronounced dark lines on the throat, underside of the tail, and sides of the belly. The sides of the belly may also have vivid orange streaks, especially during the breeding season. The only apparent external difference between males and females is the presence of enlarged postanal scales in males. Maximum snout-vent length for the species is 4.8 inches (Stebbins 1985).

This species escapes extreme temperatures by digging shallow burrows in the loose sand deposits, often in primary and secondary dunes at the base of bushes in psammophytic and creosote bush scrub vegetation communities. Adults are primarily inactive from mid-November to mid-February. Juvenile seasonal activity is often dependent on temperature fluctuations. Breeding activity takes place in the spring. This species primarily feeds on insects, but occasionally eats other lizards. They are also known to feed on buds, leaves, and flowers of plants.

The range of this species is from the vicinity of the Salton Sea and the Planning Area, south across the Colorado River Delta to the Gulf of California and Tepopca Bay in Baja

California, Mexico. The fringe-toed lizard is largely restricted to fine, loose, wind-blown sand of dunes, flats, riverbanks, and washes. Vegetation is usually sparse, consisting of creosote bush or psammophytic scrub.

3.7.3.14.3 Distribution and Occurrence within the Planning Area

The Colorado Desert fringe-toed lizard is known to occur within the Planning Area. To date, the BLM has conducted several surveys for fringe-toed lizards within the Planning Area.

3.7.3.14.4 Threats

Threats to Colorado fringe-toed lizard populations are similar to those described for the flat-tailed horned lizard.

3.8 Wildland Fire Ecology and Management

3.8.1 Fire Regimes and Risk Conditions

Fire regime refers to the nature of fires occurring over long periods of time and the prominent immediate effects of fire that generally characterize an ecosystem (Brown 2000). Fire regimes can be defined through the attributes of frequency, seasonality, size/spatial extent, rotation (or fire cycle), predictability (or variation in fire frequency), and magnitude (both intensity and severity; Agee 1993; Morgan et al. 2001). Fire regimes can be subdivided into components that vary in time, space, and magnitude; however, fire regime descriptions are often limited to the frequency and severity of wildfires.

Fire regimes vary considerably by both vegetation types and landscape characteristics. The vegetated lands in the Planning Area are classified as Fire Regime V (fire frequency of over 200 years with high severity).

Current condition classes are a function of the degree of departure from historical fire regimes resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, and canopy closure. One or more of the following activities may have caused this departure: fire exclusion or suppression, vegetation management, introduction and establishment of exotic plant species, insects or disease (introduced or native), or other past management activities (Hann and Bunnell 2001).

Table 3-7 displays the current fire regime condition classes, based on degree of departures from historical/natural fire regimes, for the vegetated lands in the Planning

Area. The vegetated lands in the Planning Area are mostly classified as Condition Class 1 (fire regimes within the historical range).

The Planning Area is covered under the CDCA Fire Management Plan.

TABLE 3-7
CURRENT CONDITION CLASSES BASED ON DEPARTURES FROM HISTORICAL FIRE REGIMES

Condition Class (CC)	Description	BLM Lands within Planning Area (acres)
CC1	Fire regimes are within a historical range and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within a historical range.	213,830
CC2	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.	--
CC3	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.	--

Source: Hann and Bunnell 2001

3.8.2 Fire Management Units and Wildfire History

The Planning Area falls within the ISD Fire Management Unit and is covered under the CDCA Fire Management Plan. Wildfire history is closely related to vegetation and climatic patterns in terrestrial ecosystems. Patterns of fire frequency, season, size, severity, and uniformity are functions of existing vegetation conditions, weather, elevation, physiographic features, ignition sources, and fire suppression activities.

The number of fires varies from year to year in the Planning Area. Fire frequency is very low, and most fires that have occurred within the Planning Area have burned less than 1 acre. Fires typically occur along the canal in the canal-influenced vegetation. Human-caused fires tend to be associated with out of control campfires or vehicles. Depending

on the location of the fire, either Imperial County Fire Department or Winterhaven Fire Department (whichever is closest) responds to the fire.

California Department of Forestry and Fire Protection (CAL FIRE) and BLM operate under a Cooperative Fire Protection Plan which states that CAL FIRE is to consider BLM's resource protection standards to select the least cost/least damaging suppression strategy (Appendix I). On all vegetation fires within the Planning Area, BLM is required to send a resource advisor to work directly with the CAL FIRE incident commander to ensure resource values are fully protected or at least mitigated.

3.9 Cultural Resources

Although an arid area, the Planning Area contains evidence of human activity from prehistoric times to the present. The eastern desert of Imperial County has served as a transportation corridor, with the Algodones dune fields forcing most travelers to seek routes to the north or south of the Planning Area until the early twentieth century.

3.9.1 Prehistoric Context

The prehistory of Imperial County, California, is typically divided into four major temporal periods: Early Man (prior to 12,000 years Before Present [BP]), Paleoamerican (12,000 to 8,000 BP), Archaic (8,000 to 1,500 BP), and Late Prehistoric (1,500 to 470 BP). These time periods have regional expression through various regional archaeological complexes or archaeological cultures.

3.9.1.1 Early Man Period

A pre-projectile point period is posited by some researchers for the greater Southwest, which includes Imperial Valley. The cultural complex that typifies this period in the region is called the Malpais Pattern. Malcolm Rogers first used the term Malpais to refer to very early materials, which he later reclassified as San Dieguito I (Rogers 1939). Julian Hayden (1976) revised the term to refer to a pre-San Dieguito complex consisting of heavily varnished choppers, scrapers, and other core-based tools typically found on ancient desert pavement areas. The assemblage lacks projectile points. Malpais materials are posited to predate the Paleoamerican or Lake Mojave/San Dieguito materials (Hayden 1976), but obtaining radiocarbon or other absolute dates for these materials has proven very elusive. Some scholars are quite skeptical of posited early occupations (Schaefer 1994). There are no sites within the Planning Area that have been identified as dating to the Early Man period (Moratto 1984).

3.9.1.2 Paleoamerican Period

The Paleoamerican period spans late Pleistocene and early Holocene, approximately 12,000 BP to about 8,000 BP. The earliest part of the Paleoamerican period in the region is represented by the Fluted Point Tradition. Fluted points have been well documented and dated for the Rocky Mountain and Great Plains areas (Haury 1975; Hester 1972; Jennings 1978; McGuire and Schiffer 1982). In these regions, they are often associated with big game kill sites and are interpreted to reflect a Big Game Hunting Tradition. In the Great Basin and California, however, their dating is more problematic. They are typically found along the shorelines of Pleistocene playas in the deserts, along fossil streams, and in passes connecting such places (Fredrickson 1973; Riddell and Olsen 1969). Some researchers suggest that this reflects a lacustrine or riparian adaptation ancestral to the Western Pluvial Lakes Tradition or Lake Mojave–San Dieguito Tradition that developed after about 12,000 BP (Moratto 1984).

The San Dieguito–Lake Mojave Complex is thought to have existed approximately 10,000 to 7,000 years ago during a time of greater effective moisture than the present in southeastern California (Warren and Crabtree 1986). The assemblage consists of heavy percussion, core, and flake-based tools: domed and keeled choppers, planes, and scrapers. One also finds light-percussion flaked spokeshaves, flaked-stone crescent-shaped tools, and leaf-shaped projectile points. In the Mojave Desert, one also finds the distinctive Lake Mojave and Silver Lake stemmed projectile points. Fluted points are also occasionally found on Lake Mojave–San Dieguito surface sites (Moratto 1984). Milling equipment is apparently rare or absent (Warren and Crabtree 1986:184).

Subsistence is generally thought to have been focused on highly ranked resources such as large mammals. This subsistence strategy may have encouraged a pattern of relatively high residential mobility. Some cleared circles, trails, and geoglyphs in the Colorado Desert (Imperial County) have been tentatively included in the San Dieguito–Lake Mojave Complex. Temporal placement of these sites is based on degree of embeddedness in desert pavements and patination, a dating method that has not been proven reliable (Hayden 1976, McGuire 1982; Rogers 1939). There are no sites within the Planning Area that have been identified as dating to the Paleoamerican period, but a number of San Dieguito Sites have been identified in Imperial County and elsewhere in the Colorado Desert (Cleland et al. 2003; Moratto 1984; Pendleton et al. 1986; Underwood and Cleland 2002).

3.9.1.3 Archaic Period

The early Archaic Period is represented by the Pinto Complex (7,000 to 4,000 BP) in the Colorado Desert. There is an apparent shift to a more generalized economy and in a gradually increased emphasis on the exploitation of plant resources. The groundstone artifacts associated with the Pinto Complex are typically thin slabs with smooth, highly

polished surfaces, not the basin metates and manos typical of later times. Rogers (1939: 52-53) argued that the thin, polished "slab metates" were not milling stones, but rather were used to process fibrous leaves or skins. Projectile points consist of the distinctive Pinto series atlatl points made with less refined, hard hammer percussion technique. The assemblage also includes scrapers, knives, scraper-planes, and choppers. The mixed core-based tool assemblage of the Pinto Complex may indicate a range of adaptations to a more diversified set of plant and animal resources brought about by a generalized desiccating trend in the West, punctuated by occasional, more mesic times. The early component at the Indian Hill Rockshelter in Anza-Borrego Desert State Park, approximately 70 miles west of the Planning Area, has been dated to this period. In general, archaeological sites dating to this period are rare in the Colorado Desert and none have been identified within the Planning Area (Cleland et al. 2003).

The late Archaic Period (4,000 to 1,500 BP) is represented by the Gypsum Complex (or Amargosa Complex). The assemblage consists of fine, pressure flaked Elko, Humboldt, and Gypsum Series projectile points, leaf-shaped points, rectangular-based knives, flake-based scrapers, drills, and occasional large, core-based scraper-planes, hammer stones, and choppers. Manos and basin metates become relatively common, and the mortar and pestle were introduced late in the complex (Warren 1984:416; Warren and Crabtree 1986:184). The development of more tool types and the addition of hard-seed processing equipment (metates) suggest a more effective adaptation to desert conditions in the region. In the Mojave Desert and adjacent areas, there are numerous pictographs of hunting scenes with mountain sheep and rabbits, suggesting a wide-spread magico-religious complex focused on hunting ritual (Moratto 1984). No Gypsum Complex sites have been identified within the Planning Area (Russell et al. 2002), but the deposit at Indian Hill Rockshelter in eastern Imperial Valley has a Gypsum Complex component, and others have been noted in the adjacent Colorado Desert (McDonald 1992).

3.9.1.4 Late Prehistoric Period

The Late Prehistoric Period, local manifestations of which are often called the Patayan Pattern or Patayan Complex (1,500 to 470 BP), is characterized by dramatic cultural change and a dramatically expanded population in the Salton Trough. Paddle and anvil pottery was introduced, probably from Mexico by way of the Hohokam culture of the middle Gila River area (Schroeder 1975, 1979; Rogers 1945). A subsistence shift from hunting and gathering of desert and river resources (Patayan I) to floodplain horticulture (Patayan II) took place at this time along the Colorado River and perhaps along the Alamo River and New River (Baksh 1994, Forde 1931, Kroeber 1925). Cottonwood Triangular series projectile points and Desert Side-notched Series projectile points (signifying the advent of the bow and arrow), as well as Lower Colorado Buffware pottery, appear at approximately 1,250 BP in the Colorado Desert (Heizer and Hester 1978; Waters 1982). Burial practices also shifted from inhumations to cremations.

Numerous trails that appear to date to this period throughout the Colorado Desert suggest the growing importance of long and short distance travel for trading expeditions, religious activities, visiting, and warfare. Other culture traits generally associated with the Patayan Complex include increasingly elaborate kinship systems, expanded trade networks, and rock art, including ground figures which include the famous geoglyphs or ground figures found along the Colorado River (Davis 1961; McGuire 1982; Warren 1984). The greatly increased number of Late Prehistoric Period archaeological sites suggests an expansion of population. The settlement pattern is characterized by small mobile groups living in seasonal settlements along the Colorado River floodplain. These locations were influenced by the filling and desiccation of Lake Cahuilla at least four times during this period (Schaefer 1994). The majority of the prehistoric sites (ceramic scatters) within the Planning Area are included in this time period.

3.9.2 Ethnographic Context

The Planning Area was utilized prehistorically by a variety of Native American groups, including the Kumeyaay (the Kamia is a subset of this group), the Cocopah, and the Quechan. These three groups speak the language of the Yuman family of the Hokan language stock (Kroeber 1920). Short descriptions of their individual ethnographic context are outlined below. The Paipai, the Chemehuevi, the Mohave, and the Cahuilla also used the Planning Area for travel and trade (Russell et al. 2002). The extreme aridity of the Planning Area suggests that permanent habitation sites probably do not exist there; but temporary camps, resource acquisition and processing sites, and travel corridors are known to occur, especially around the dune margins. The dune margins to the east support a microphyll woodland plant community that consists of deciduous, deep-rooted trees such as honey mesquite, ironwood, desert willow, blue palo verde (*Cercidium floridum*), little-leaf palo verde (*Cercidium microphyllum*), and smoke tree. Shrubs include catclaw acacia (*Acacia greggii*), cheesebush (*Hymenoclea salsola*), and chuparosa (*Justicia californica*). These plants attract various birds. The high dunes have little vegetation but include desert buckwheat (*Eriogonum deserticola*), sand-food (*Pholisma sonorae*), sand verbena (*Abornia villosa*), dune primrose (*Oenothera deltoids*), desert lily (*Hesperocallis undulata*), and coyote melon (*Cucurbita palmata*). Lizards are common in the high dunes (Schoenherr 1992).

3.9.2.1 The Kumeyaay

It is useful to think of the Kumeyaay as three closely related groups based on differences in dialects (Langdon 1970, 1975; Luomala 1978; Spier 1923) and geography (Barker 1976; Gifford 1931): the northern Kumeyaay or Ipai, the southern Kumeyaay or Tipai, and the Desert Kumeyaay or Kamia. The northern and southern Kumeyaay were subjugated by the Franciscan missionaries and Spanish imperial forces at San Diego, and were until recently known as Diegueño. They occupied mountain and coastal areas of what is now San Diego County (Langdon 1970, 1975; Luomala 1978; Spier 1923).

The term Kamia, like Kumeyaay, has been used to refer to all three divisions (e.g., Forbes 1965), but now is most commonly used to refer only to the desert division. In the following discussion, Kumeyaay refers to the Ipai and Tipai of San Diego County and Baja California Norte, while Kamia refers to the desert branch.

Traditional Kumeyaay territory covered the southern two-thirds of San Diego County, from Agua Hedionda (south of Carlsbad) south to some 20 miles below Ensenada, Baja California Norte. On the west, Kumeyaay territory started at the Pacific Ocean and extended to the mountains of the Peninsular Range and into the desert just beyond (Cline 1984; Gifford 1931:1-2; Spier 1923:298). While they did not live in the Planning Area, they did travel to Imperial County to trade.

The Kumeyaay lived in semi-sedentary, politically autonomous villages or rancherias. A settlement system typically consisted of two or more seasonal villages with temporary camps radiating away from these central places (Cline 1984). Their economic system consisted of hunting and gathering, with a focus on small game, acorns, grass seeds, and other plant resources. The small game consisted mostly of rabbits. Bighorn sheep and deer were also hunted occasionally. Agave (mescal) was also an important food found along the arid eastern slopes of the Peninsular Range. The most basic social and economic unit was the patrilocal extended family (Luomala 1978).

Trade was an important feature of Kumeyaay subsistence. Coastal groups traded salt, dried seafood, dried greens, and abalone shells to inland and desert groups for products such as acorns, agave, mesquite beans, and gourds (Almstedt 1982:10; Cuero 1970:33; Luomala 1978:602). Travel and trade were accomplished by means of an extensive network of trails, some of which traversed Imperial Valley and passed by or through the Dunes. Kumeyaay living in the mountains of eastern San Diego County frequently used these trails to travel down to the Kamia settlement of *Xatopet*, located in Imperial County, to trade and socialize in winter (Castetter and Bell 1951; Gifford 1918:168; Spier 1923:300; Woods 1982).

3.9.2.2.1 The Kamia

Gifford suggests that the precontact population of the Kamia "could not have been more than a few hundred" (1931:16). Their traditional territory included the southern Imperial Valley from the latitude of the southern half of the Salton Sea to well below what is the US-Mexico border. On the west, Kamia Territory extended to the foothills of the Peninsular Mountains, and on the east, Kamia territory extended up to the sand dunes (Forbes 1965; Luomala 1978:593). It included a piece of territory east of the Cocopah Mountains along New River/Hardy River extending to within perhaps 25 miles of the Gulf of California. The Kamia lived at times along the west bank of the Colorado River among the Quechan, but their main settlements were along the New and Alamo rivers (Gifford 1931). Because of the wide variation in the water supply, the Kamia often had to move

from one planting area to another. They also gathered and hunted over a very large area.

Subsistence among the Kamia consisted of hunting and gathering, and floodplain horticulture (Barker 1976; Gifford 1931). In normal years, the Colorado River would overflow its banks in the spring and early summer and fill the delta tributaries of rivers such as the New and Alamo. When the floodwater receded, the Kamia would plant maize, black-eyed beans (cowpeas), tepary beans, watermelons, pumpkins, and gourds in the mud (Gifford 1931). The watermelons were introduced by Europeans prior to 1700 when Father Eusebio Francisco Kino made his trip through the dunes (Castetter and Bell 1951: 127). Kino had traveled from Sonora, Mexico, to the vicinity of present-day Yuma and determined that Baja California was not an island. He also founded San Xavier del Bac in 1700 and explored the confluence of the Gila and Colorado (Bolton 1932). The black-eyed beans were also introduced by Europeans prior to 1775 (Castetter and Bell 1951:129). The Kamia had a small dam at *Xatopet* on the east/west portion of the Alamo River to control water flow and allow farming in years when water flow was insufficient. Likewise, small dams and ditches used to irrigate crops were also reported in the vicinity of Algodones–Pilot Knob (Castetter and Bell 1951:43). Gifford (1931:22) and Castetter and Bell (1951:43) suggested these were recent adaptations and not traditional. Bean and Lawton (1973), Lawton and Bean (1968), and Shipek (1988) argue that irrigation was indigenous.

For all the Colorado River people, including the Kamia, the major food staple was mesquite and screwbean trees, called by the Kamia *anxi* and *iyix*, respectively (Gifford 1931:23). Seeds of ironwood and palo verde trees were also used. Neither palo verde nor ironwood was considered a particularly desirable food resource (Castetter and Bell 1951:195-196). The eastern edge of the dunes contains these trees in the microphyll woodlands (Schoenherr 1992). Acorns were at times an important food. They were gathered in the mountains to the west of Kamia territory in October and acquired through trade from the southern Kumeyaay (Gifford 1931).

Hunting contributed to the diet in a minor way in terms of overall caloric intake, but provided valuable protein, and skin and bone for clothing, blankets, and tools. Small game, primarily rabbits, was most frequently taken, using bow and arrow or rabbit stick (*macana*). Sometimes fires were set along sloughs to drive rabbits out. Individuals with bow and arrow also hunted deer and mountain sheep. Fish were also taken in sloughs with bow and arrow, by hand, hooks, and basketry scoops. Seine nets were larger than scoops and were used by six men to catch fish in the Colorado River, lakes, and large sloughs (Gifford 1931:26). These fish formed the main source of protein for all the tribes along the Colorado River. Salt was obtained 2 to 3 miles southwest of the Algodones Dunes (Gifford 1931:24).

3.9.2.2 The Cocopah

The Cocopah lived on the west side of the Colorado River delta from the tidewater area, north to a little above the latitude of Volcano Lake or Cerro Prieta, several miles south of the US-Mexico border (Castetter and Bell 1951:52; Gifford 1933:261; Kroeber 1920). Like other river Yumans, the Cocopah settlements were dispersed residential areas or rancherias, not close-knit villages (Castetter and Bell 1951:53).

Cocopah subsistence was similar to other river Yuman people, although their location in the Colorado River delta area had a somewhat different environment from that of the upstream tribes. The Colorado River frequently changed course within the general floodplain throughout the area below the Grand Canyon. The river formed very active meanders in the delta region, requiring settlement and field movement among the Cocopah and other delta peoples (Castetter and Bell 1951; Sykes 1937). Mesquite and screwbean grew in profusion and formed a dietary staple of the Cocopah, as it did for other Yuman people. Other important wild food sources of the delta region were "wild rice or wild wheat," and *quelite* or amaranth (Castetter and Bell 1951:192). Castetter and Bell (1951:743) suggest that the Cocopah utilized wild plant foods more extensively than other river Yumans, obtaining only about 30 percent of their food from horticulture. The Cocopah planted a variety of maize, pumpkins, tepary beans, cowpeas, muskmelons, watermelons, and heshmicha (grain resembling wheat), and sugar cane (Gifford 1933). As mentioned above, the cowpeas and watermelons were adopted from Europeans. Hunting was relatively unimportant and was confined primarily to the hills and mountains. Fish was the most important animal food among Lower Colorado River peoples. The Cocopah fished in the Colorado and Hardy rivers, and occasionally parties would fish along the Gulf of California. Fish were also taken with bow and arrow, as well as spears, gill nets, and dip nets (Castetter and Bell 1951:216; Gifford 1933:268).

The Cocopah frequently visited the mountainous Paipai country west of the delta to trade and to gather pine nuts and acorns. Tobacco, mescal (roasted agave), and mountain sheep skins were obtained from the Paipai in exchange for delta foodstuffs. The Cocopah also obtained tobacco and eagle feathers from the Kumeyaay (Castetter and Bell 1951:54; Kelly 1977; Sample 1950:22). At times, the Cocopah traded seashells to the Kamia (Gifford 1931:37). They also visited frequently with their allies, the Maricopa, on the middle Gila River and with the Halchidhoma who lived in the Blythe area from about 1700 to 1830 (Gifford 1933; Kelly 1977).

3.9.2.3 The Quechan

The Quechan (*Kwatsan*) were formerly called the Yuma Indians. Their territory was centered at the confluence of the Gila and Colorado Rivers (present-day Yuma, Arizona), but extended north on the Colorado about 60 miles, and 30 miles up the Gila. According to Quechan tradition, the northern boundary was in the vicinity of Blythe,

California; the southern boundary reached into Baja California and Sonora, Mexico. Their neighbors on the northwest were the Cahuilla and Luiseño, and to the west were the Kamia. Their eastern boundary was just west of Gila Bend, Arizona (Miguel n.d., cited in Bee 1982:37).

The Quechan had a relatively large population. The Quechan are not mentioned by Alarcon or Diaz at the time of first Spanish contact in 1540. The next visitor to the area, Juan Oñate, estimated a population of about 4,000 in 1604 (Bee 1983; Forbes 1965:343). He mentioned a stable horticultural and gathering economy. Throughout winter and spring, the Quechan lived in large, seasonal settlements or rancherias located on terraces above the Colorado River floodplain. These winter settlements were moved from time to time, and establishing their precise locations is problematic (Bee 1982:40-44, 1983:87; Forde 1931:101). When the floodwaters of spring receded, the Quechan left their winter villages on the river terraces and dispersed into camps near their 2- to 3-acre horticultural plots distributed along the river floodplain. Extended families resided in these camps. Planting was done in the mud as the river receded. Major crops included maize, squash, pumpkin, watermelon, and wheat (Castetter and Bell 1951). Wheat was introduced by Kino in 1700 (Castetter and Bell 1951:123). After the fall harvest season, the Quechan would reconvene in villages on terraces above the river to avoid seasonal flooding (Bee 1983:88; Forde 1931:101).

Quechan villages were actually a collection of houses, or rancherias, dispersed along the Colorado and Gila rivers. Households consisted of composite families that lived together and moved, more or less as a unit, from place to place within a constantly changing floodplain environment. The annual flood of the Colorado constantly changed the gardening areas, eroding some and burying others under tons of silt. This undoubtedly changed the desirability of potential village sites, camp sites, and garden plots from time to time. The Quechan burned the houses and possessions of the dead (Bee 1982, 1983; Forde 1931; Trippel 1889:583), which also contributed to the movement of villages from time to time (Trippel 1889:583). Like other Lower Colorado Yuman peoples, the Quechan moved through their territory in a very dynamic cultural landscape (Bee 1982, 1983; Forde 1931).

Despite the proximity of the Quechan settlements to the Planning Area, there is almost no mention of the dunes in trade and travel accounts. The dunes were used as a plant gathering place. Plants included desert lily, sandroot, berries, cactus, and cattails (Russell et al. 2002). According to Russell et al. (2002), the Algodones Dunes were not significant for subsistence and daily life. The dunes are significant, however, as a boundary area. The dunes also have spiritual significance since they figure in Quechan origin accounts and other parts of their oral traditions. The Quechan and other tribes used trails that passed south and north of the dunes, as well as through the dunes at Buttercup Pass—the area where I-8 and the All-American Canal cross the dunes, and the Glamis area—where SR-78 passes through the dunes (Russell et al. 2002).

3.9.3 Historic Context

The first Spanish exploration of southern California began when Hernando de Alarcón sailed up the Colorado River, probably to the confluence of the Gila or the Yuma area in August of 1540 (Forbes 1965:88). In September 1540, Melchior Diaz marched from Sonora, Mexico, to the confluence of the Colorado and Gila rivers (Lawton 1976:46). Cabrillo sailed up the Pacific coast in 1542 and discovered San Diego Bay and other places along the coast of Alta California (Pourade 1960).

In 1769, the first European settlement of Alta California occurred with the founding of the mission and presidio at San Diego. This created a need for a travel route linking Sonora to Alta California. The Franciscan Padre Francisco Garcés was the first to explore the area west of Yuma, beginning near Tucson in 1771 and exploring the Colorado River delta and the area just southwest of the dunes (Forbes 1965; Pourade 1960:12-13; Lawton 1976:46).

The first Spanish explorer to actually enter the Imperial Valley was Pedro Fages, who rode along the northwestern edge of the Colorado Desert while looking for deserters from San Diego in 1772. He apparently entered the desert on an Indian trail he discovered, which led through Oriflamme Canyon to Carrizo Creek and the desert floor (Bolton 1931:214; Lawton 1976:47; Pourade 1961:53-54).

The first Juan Bautista de Anza expedition (which included Padre Francisco Garcés) set out from Tubac, Sonora, in January 1774 and arrived at Yuma a month later. Avoiding the Algodones Dunes west of Yuma, the expedition headed south to Laguna de Merced, then west. He re-entered what is now the US in Imperial Valley west of Signal Peak. Anza's route then went to what he called Santa Rosa de las Lajas (now known as the Yuha Well) in the Yuha Desert south of Plaster City. From there the expedition continued north through the Yuha Desert and went through what is now the community of Borrego Springs and north to San Gabriel (Forbes 1965). A second Anza expedition utilized the same general route through the Imperial Valley in 1775 and brought settlers to found the pueblo of Los Angeles. The Yuma route was abandoned in 1781 after the Quechan destroyed the Spanish settlements near Yuma (Forbes 1965).

In the 1820s, Mexicans began using the route again, and it became known as the Sonora Road (Warren, E. et al. 1981:85). During the Mexican–American War, the Army of the West under General Stephen Watts Kearney and the Mormon Battalion led by Colonel Phillip St. George Cooke also followed the same route in 1846. The war ended with the Treaty of Guadalupe Hidalgo, signed on February 2, 1848. After the discovery of gold in 1849, the route became a popular, all-weather route to California (which became a state in 1850; Pourade 1963) known as the Southern Emigrant Trail. In 1857, a portion of the route was used for the first transcontinental mail route (Birch's San Antonio-San Diego Mail Line) between San Diego and the east. In late 1858, the route was followed by the better known Butterfield Southern Overland Mail Line. Beginning with Anza, all

these routes crossed the Colorado River in the Yuma vicinity, passed south of Pilot Knob and the sand dunes, and headed west through northern Baja California. The routes re-entered the US in western Imperial County and then headed north (van Wormer et al. 2007).

The San Diego to Fort Yuma Wagon Road was opened in 1865. The same basic route was followed by Old Highway 80, although there were several variations (Wray 2004:114-115). In 1873, a military telegraph line was installed from San Diego to Fort Yuma paralleling the road (Elliott 1883).

In the mid-1880s, to support local mining efforts, the Southern Pacific Railroad built a line that crosses what is now the eastern portion of the Planning Area. It is the same railroad that is now known as the UPRR. Double tracks have been added to some segments of the UPPR since the mid-1880s (Sander and Maxon 2007). Regular service on the route began in 1877 (Pourade 1964). These old steam locomotives had to stop and take on water every few miles, and small communities such as Pilot Knob, Ogilby and Glamis developed at some of the stops along the line. After 1901, and the opening of the Imperial Canal, the Imperial Valley experienced considerable population growth. The availability of Colorado River water made this formerly barren area a highly productive agricultural area. In 1905, the river broke through the headgate of the canal and soon the entire flow of the river was rushing into Imperial Valley along what is known as New River. This flood event created what we know as the Salton Sea. Through the combined efforts of the Santa Fe and Southern Pacific railroads, Imperial Valley was saved and the break was finally closed in 1907 (Nadeau 1997). To the present day, Imperial Valley remains an important agricultural area. The Salton Sea level is maintained by agricultural runoff.

In 1915, the planning and hard work of a group of businessmen, including Edward Fletcher and Edwin Boyd, resulted in the construction of the first plank road though the Planning Area (PHR Associates and Carrico 1989). At one time, there were 7 miles of the wooden road, providing a route that shortened travel time from San Diego to Yuma by two days (Bates 1970). The plank road was abandoned in 1926, when an asphalt road (Highway 80) was completed through Buttercup Pass linking San Diego with Tybee Island, Georgia, on the Atlantic coast.

The disastrous flooding of Imperial County from 1905 to 1907, and subsequent floods elsewhere, convinced the federal and state governments of the Southwest that major dams needed to be built on the Colorado River. The first of these, Boulder Dam, later called Hoover Dam, was completed in 1935. Despite considerable skepticism, the All-American Canal was built through the formidable sand dunes at Buttercup Pass in 1940. The All-American Canal was integral in the agricultural development and settlement of the Imperial and Coachella valleys. The area served by the All-American Canal has become one of the richest and most important agricultural areas in the US (Queen 1999).

During World War II, undeveloped portions of southeastern California, western Arizona, and southern Nevada became a vast military training area. Camp Pilot Knob, located west of the Planning Area, was one of the desert military training camps established by General George S. Patton, Jr. This large temporary settlement comprised 3,000 tents occupied by the 55th Infantry Division. In 1943, they used the camp and the surrounding areas, including the Planning Area, for military training maneuvers (Bischoff 2008; Meller 1946 as appears in Cleland et al. 2003).

In 1964, the old transcontinental Highway 80 was replaced by I-8 through the ISD. Later, electrical transmission lines, fiberoptics cables, and other utilities passed through the Buttercup Pass corridor (Apple et al. 2006; Dominici 1981; Schaefer and Andrews 2005; Schaefer et al. 1998).

3.9.4 Previous Research

A records search was conducted at the El Centro BLM office to identify previous studies in the area and to locate known cultural resources. A total of 41 investigations have been conducted and 175 cultural resources have been recorded within the Planning Area.

3.9.4.1 Inventories

The BLM recognizes three classes of cultural resources inventories:

- Class I inventories are professionally prepared, large-scale heritage resources overviews. They consist of:
    - compilation and analysis of all reasonably available cultural resource data and literature
    - management-focused, interpretive, narrative overview
    - synthesis of the data

    The overview also defines regional research questions and treatment options.
- Class II inventories are sample field surveys. This means that only a portion of a particular study area is selected for survey, typically on the basis of a stratified, probabilistic sample. The areas selected for survey are thoroughly examined to locate and record all heritage resources, so in a sense these sampled sections within a Class II inventory are similar to a Class III inventory. The sampled portions of Class II inventories and Class III inventories are recorded as surveyed in the California Historical Resources Information System. Class II inventories are typically used to provide overviews for large study areas. These studies attempt to characterize the site distribution, site density, and diversity in a particular study area.

- Class III inventories are intensive field surveys. They consist of complete coverage of a particular study area. The goal of a Class III inventory is to locate and record all heritage resources within the survey area and to provide provisional NRHP evaluations based primarily on site surface data.

TABLE 3-8
CULTURAL RESOURCE PROJECTS WITHIN THE PLANNING AREA

Author	CRM Company	Title	Year
n/a		Grays Well Bridge Construction, California Desert District, El Centro Resource Area, Imperial Sand Dunes Recreation Area	n.d
n/a	BLM	Cultural Resource Clearance of a Free-Use Permit CA-060-FP3-4	1978a
n/a	BLM	Cultural Resource Clearance on Proposed Material Sale Permit MP8-6	1978b
n/a		Draft Environmental Assessment Record East Mesa Non-competitive Leases for Geothermal Exploration/Development	n.d.
Apple et al.	EDAW	Cultural Resources Overview and Survey Report for the North Baja Expansion Project	2006
Brenzikofer, Amber	Parsons	Biological and Cultural Evaluation: Union Pacific Railroad Segment 2A – Niland to Araz Yuma Subdivision Capacity Expansion Project, Imperial County, California	2007
Bull, Charles S.	RECON	A Summarization of an Archaeological Sample of the Glamis/Dunes Area, Imperial County, California	1981
Cheever, Dayle and Judy Berryman	e2m	Cultural Resource Inventory for Proposed Construction, Operation, and Maintenance of Tactical Infrastructure for Customs and Border Protection, El Centro Sector, California	2008
Cleland, James H. and Rebecca McCorkle Apple	EDAW	Historic Properties Treatment Plan for the North Baja Gas Pipeline Expansion Project	2006
Collins, G. Edward and Jay C. von Werlhof	Imperial Valley Desert Museum	Cultural Resource Survey and Assessment of the Westside Main Flood Control (WSMFC) Area	1996
Dominici, Debra	Caltrans	Archaeological Survey Report for the Proposed Sand Hills Interchange Project	1981
Dominici, Debra	Caltrans	Archaeological Phase I Survey Report for the Proposed Ogilby Material Site	1982
Hale, Micah	ASM Affiliates	Cultural Resources Inventory for the South Dunes Operations Center	2005
Hangan, Margaret	BLM	Grays Well Bridge Road and Border Patrol Traffic Barriers	2000

TABLE 3-8
CULTURAL RESOURCE PROJECTS WITHIN THE PLANNING AREA (CONT.)

Author	CRM Company	Title	Year
Johnson, Barnhart	BLM	Glamis Gravel Free-Use Permit	1976
Maxon, James C.	Water and Power Resources Service	Cultural Resource Inventory of the Proposed Wildlife Windmill/Watering Sites along the Coachella Canal, Imperial Valley, CA	1981
McKinney, Charles M.		Glamis KGRA	1973
Nicolai, Nancy	ECRA	Environmental Assessment FONSI for the Watchable Wildlife Site – Algodones Dunes	1996
Pendleton, Lorann et al.	Wirth Environmental Services	Archaeological Investigations in the Picacho Basin: Southwest Powerlink Project – Sand Hills to the Colorado River Segment	1986
PHR Associates		The Plank Road of Imperial County	1989
Queen, Rolla L.	BLM	BLM Off-Road Vehicle Bridge Off-Highway Vehicle Grant OR-1CD-172 Grays Well Bridge 96: Evaluation of Significance and Effects All-American Canal	1999
Rosenberg, Seth and Brian F. Smith	Brian F. Smith and Associates	A Class III-Intensive Field Survey for the Yuma Sector Project	2008
Russell, John C., Clyde M. Woods, and Jackson Underwood	EDAW	As Assessment of the Imperial Sand Dunes as a Native American Cultural Landscape	2002
Sander, Jay K. and Patrick O. Maxon	Chambers Group	Phase I Cultural Resources Reconnaissance for the Union Pacific Railroad, Yuma Subdivision Capacity Project, Riverside and Imperial Counties, California	2007
Schaefer, Jerry et al.	ASM Affiliates	A Cultural Resources Inventory and Evaluation of the Imperial Irrigation District's C-Line Pole Replacement Project, Imperial County, CA	1998
Schaefer, Jerry and Collin O'Neill	ASM Affiliates	A History and Evaluation of the Old Coachella Canal, Imperial County, California	1998
Schaefer, Jerry and Collin O'Neill	ASM Affiliates	The All-American Canal: An Historic Properties Inventory and Evaluation	2001
Schaefer, Jerry and Sherry Andrews	ASM Affiliates	Class II and III Cultural Resources Inventory and Evaluation for the All-American Canal Lining Project, Imperial County, CA	2005

TABLE 3-8
CULTURAL RESOURCE PROJECTS WITHIN THE PLANNING AREA (CONT.)

Author	CRM Company	Title	Year
Schaefer, Jerry and Sinead Ni Ghabhlain	ASM Affiliates	A History and Evaluation of the Coachella Canal, Riverside and Imperial Counties, CA	2003
Schaefer, Jerry and Mark Giambastiani	ASM Affiliates	A Class I Cultural Resources Inventory for the All-American Canal Lining Project	2004
Smith, David M., et al.	Chambers Group	Phase II Test and Evaluation for Cultural Resources, Union Pacific Railroad, Yuma Subdivision Capacity Project, Riverside and Imperial Counties, California	2008
Thomas, Greg		Results of a Pedestrian Survey, Osborne Overlook, Imperial County, California	2002
Underwood, Jackson and James H. Cleland	EDAW	Class II Archaeological Survey of the Imperial Dunes	2002
von Werlhof, Jay	Imperial Valley College Museum	Archaeological Survey of the Gordons Well Plantation Powerline	1986
von Werlfof, Jay and Sherilee von Werlhof	Imperial Valley College Museum	Archaeological Examinations of Certain Portions of Chocolate Mountains	1977a
von Werlfof, Jay and Sherilee von Werlhof	Imperial Valley College Museum	Archaeological Examinations of Certain Test Drill Hole Sites on Pilot Knob Mesa	1977b
von Werlfof, Jay and Sherilee von Werlhof	Imperial Valley College Museum	Addendum: Archaeological Examinations of Certain Drill Holes near Glamis, CA	1977d
von Werlfof, Jay and Sherilee von Werlhof	Imperial Valley College Museum	Archaeological Examinations of the Occidental Geothermal Incorporated Sites near Glamis, CA	1979a
von Werlfof, Jay and Sherilee von Werlhof	Imperial Valley College Museum	Archaeological Examinations of Certain Geologic Sites in Imperial Valley	1979b
Weakly, Ward F.	BLM	Archaeological Survey and Evaluation Studies for the Coachella Canal, Imperial County, CA – Colorado River Basin Salinity Control Project	1975
Weller, Pat		Field Exam of Gordons Well Bridge Site	1995

CRM = cultural resource management

At least 41 archaeological studies have been conducted within the limits of the Planning Area (Table 3-8). Two of these were Class I inventories, two were Class II inventories, and thirty of these were Class III inventories. The other seven investigations included historic treatment plans, historic contexts, evaluation studies, and a cultural landscape investigation. The earliest documented study occurred in the 1950s; about half of the surveys were carried out in the 1970s and 1980s, and the other half was carried out after

1995. Many of the inventories were associated with linear projects (canals, pipelines, and transmission lines). An exception to this was a major sample survey effort (Class II) that the BLM conducted in the late 1970s and early 1980s. In this study, a large number of 1-mile by ¼-mile transects were surveyed throughout the Planning Area (Bull 1981).

In 2002, the BLM contracted for an extensive cultural landscape study of the Planning Area (Russell et al. 2002) in order to determine if the sand dunes system qualified as one large traditional cultural property. The study began with an extensive review of the ethnographic and ethnohistoric literatures. This was followed by contacting eight Native American tribes with heritage associations with the Planning Area. Tribal representatives were interviewed about present and past use of and the spiritual and cultural connections with the entire sand dunes system. The results of the interviews and the literature reviews indicate that the Planning Area or the sand dunes system has some cultural significance for contemporary Native Americans, but does not meet the NRHP criteria to be a traditional cultural property. All groups interviewed expressed concern about damage to the dunes landscape by recreational use (Russell et al. 2002).

A Class II archaeological survey was conducted in 2002 in order to supplement the cultural landscape study. A stratified systematic random sample survey of 3 percent of the entire dune system and an additional 2 percent sample of the Quaternary alluvium within the dunes and dune edges was undertaken in the spring of 2002 (Underwood and Cleland 2002). This 5 percent sample of the dune system yielded four archeological sites: three pottery sherd scatters and a historic military marksmanship training site.

Despite a number of studies having been conducted, most of the Planning Area has not been inventoried for cultural resources. Based on the records search results, the level of survey appears to vary in different parts of the Planning Area. The southern portion of the Planning Area has been subject to the most survey investigations. These investigations were generally associated with infrastructure projects, such as the lining project for the All-American Canal, and the sample surveys conducted in the late 1970s and early 1980s (Bull 1981) and in 2002 (Underwood and Cleland 2002).

3.9.4.2 Cultural Resources

Both prehistoric and historic cultural resources have been recorded within the Planning Area. Prehistoric sites include lithic scatters, ceramic scatters, ground stone scatters, habitation sites or temporary camps, cremations, a prehistoric trail, a quarry, and a rock feature. Lithic scatters consist of sites containing more than three chipped or flaked stones resulting from human manipulation. Artifacts found in lithic scatters include flakes, debitage, and/or flaked stone artifacts. Ceramic scatters consist of a collection of more than three pot sherds. Ground stone scatters consist of a collection of more than three manos, metates, or other ground or pecked stone artifacts. A habitation site or temporary camp consists of a wide range of artifacts types and may have features. A

cremation consists of human remains/bones that have been burned to the point of appearing calcined. A prehistoric trail is a linear feature formed through repetitive use. A quarry contains a source of lithic material with evidence of human use. A rock feature consists of a patterned arrangement of rocks purposefully constructed (adapted from California Office of Historic Preservation 1995).

Historic period sites documented within the Planning Area include trash scatters, the All-American Canal, the Old Coachella Canal, the Southern Pacific Railroad and associated railroad sites (former stations and trash scatters), the Pilot Knob to Drop 4 Transmission Line, border monuments, a dry lake bed, a graveyard, a machinery repair workshop, a rock feature, the Old Plank Road, Old Highway 80, and military encampments. Historic trash scatters consist of a collection of items at least 50 years old such as metal cans and glass bottle fragments. A rock feature refers to a patterned arrangement of rocks that dates to the historic era. Associated railroad sites include trash scatters, railroad graded areas, and abandoned stations with foundations and pads. The military encampments may consist of collections of fired ammunition and other historic artifacts.

There are 175 cultural resources recorded in the Planning Area. As Table 3-9 below indicates, most of these are prehistoric archaeological sites, representing a range of activities described above. Fewer historic period resources have been identified. These cultural resources reflect the major historic themes of the region: mining, transportation, irrigation projects, and military activity.

TABLE 3-9
PLANNING AREA CULTURAL RESOURCE SUMMARY

Prehistoric Resources		Historic Period Resources		Unknown	
Lithic scatters	10	Trash scatter/dump	16	Isolates	11
Ceramic scatters	53	Military encampment	2		
Habitation areas/temporary camps	5	Road	4		
Ground stone scatters	4	Canal	2		
Cremation	3	Transmission line	1		
Isolated finds	26	Rock feature	1		
Other	3	Border monument	3		
		Railroad	13		
		Graveyard	1		
		Isolated finds	16		
		Other	2		
Total	104	Total	61	Total	11

Archaeological sites within Special Designation Areas are depicted in Table 3-10. These Special Designation Areas offer enhanced protection for heritage resources (e.g., WA and ACECs). Surveying or resurveying all management areas for cultural resources as well as continued monitoring of known sites would occur under Section 110 of the NHPA as funding is available.

TABLE 3-10
SITES WITHIN SPECIAL DESIGNATION AREAS

Site Number	Area
IMP-1383, -1384, -1385, -3811, -4764H, -4910, 7158H	Plank Road ACEC
IMP-1150, -1152, -4398, -4635, -4636, -5283, -7158H	North Algodones Dunes Wilderness
P-008620	East Mesa ACEC

3.9.5 Site Significance

The management of cultural resources on BLM land must be in compliance with several federal laws, including the Antiquities Act of 1906; the NHPA of 1966, as amended; the NEPA of 1969; EO 11593—*Protection and Enhancement of the Cultural Environment*; the Federal Land Policy and Management Act of 1976; the American Indian Religious Freedom Act of 1978; the Religious Freedom Restoration Act of 1993; the Archaeological Resource Protection Act of 1979; the Native American Graves Protection and Repatriation Act of 1990; EO 13007—*Indian Sacred Sites*; and EO 13287—*Preserve America*. The NHPA of 1966 requires all federal agencies to take into account the effects of their actions on the nation's historic properties (Section 106), and directs federal agencies to assume responsibility for the preservation of historic properties that are owned or controlled by such agency (Section 110). Under the NHPA, site significance and eligibility to the NRHP need to be evaluated in terms of a historic context that identifies geographic area, period of significance, historical themes or research questions, and Native American values. The historical context describes significant broad patterns of prehistory or history based on cultural themes and their geographical and chronological context. Site-specific contexts should include time period of occupation, identification of occupants, and function. Historic themes may include agriculture, transportation, ranching, mining, exploration, and the military. Prehistoric themes may include settlement system, economy, and spirituality. Native American land use areas of concern may include rock art, cremation sites, and traditional cultural areas. Traditional cultural areas include places that represent or imbue the traditions, beliefs, lifeways, arts, crafts, and social institutions of any community, not just Native American communities (Parker and King 1998; Parker 1985). The historical context is sometimes used to generate research questions needed to evaluate individual sites. All sites identified on BLM-administered lands within the Planning Area should be evaluated for

eligibility for inclusion to the NRHP because of BLM's responsibility to preserve historic properties under Section 110 of the NHPA and to take into account effects of their undertakings on historic properties under Section 106 of the NHPA (36 CFR 800). Eligibility is based on the following:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association; and:
>
> A) that are associated with events that have made a significant contribution to the road patterns of our history; or
>
> B) that are associated with the lives of persons significant in our past; or
>
> C) that embody the distinctive characteristics of a type, period, or method of construction, or representation of the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D) that have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR 60.4)

A NRHP-eligible site must meet one or more of the above criteria and have integrity appropriate to the criteria. In most cases, prehistoric sites qualify under criterion D; Historic Period properties often qualify for listing under criterion A, B, or C. Integrity varies in terms of the criterion under which the site is evaluated. For example, an archaeological site evaluated under criterion D would need to have the potential to provide meaningful scientific research data. If the site has been disturbed or damaged to the extent it cannot do this, it would lack integrity. Historic buildings, on the other hand, typically need to be in their original location and be relatively unmodified or restorable to have integrity under criterion A, B, or C. Historic buildings and structures must also evoke the historic period of significance to a lay person.

Under special consideration, some heritage resources not otherwise eligible may be considered eligible. These include religious properties, moved properties, birthplaces and graves, cemeteries, reconstructed properties, commemorative properties, and properties less than 50 years old. These special considerations include:

a) A religious property deriving primary significance from architectural or artistic distinction or historical importance; or

b) A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

c) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his or her productive life; or

d) A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

e) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

f) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

g) A property achieving significance within the past 50 years, if it is of exceptional importance.

Prehistoric and historic resources should be evaluated in order to:

a) Determine site or structure type, appropriate criteria of eligibility and level of integrity so that an appropriate treatment plan can be developed;

b) Determine the horizontal and vertical surface extent of each site, as well as information regarding internal variability; and

c) Determine, which sites are significant and warrant protection and consideration in the planning process.

Until site significance is determined, all prehistoric and historic resources on BLM-administered lands should be managed under the assumption that they are eligible for the NRHP. A preliminary level of significance may be assigned for a site based on surface observations. Confirmed level of significance is assigned, when the appropriate evaluation program, such as surface artifact collection or subsurface testing, has been completed. Evaluation of historic structures and historic archaeological sites typically requires archival research, including a literature review and historic maps (see Parker 1985).

The literature review and record search was based on records available at the ECFO. This review of existing site records revealed that the vast majority of sites on BLM-administered lands within the Planning Area have not been evaluated for significance (Appendix J). None of the cultural resources within the Planning Area are listed on the NRHP. Twenty-three sites (10 prehistoric, 13 historic) have been recommended as eligible for inclusion on the NRHP. Seventy-six sites (4 prehistoric sites, 16 historic sites, 42 isolates) have been recommended not eligible for inclusion on the NRHP. Of the 42 isolates, 26 are prehistoric isolates, 16 are historic isolates, and 11 are unknown due to missing site forms. Isolates are not considered eligible for NRHP. Four prehistoric sites and 16 historic sites are not eligible. Sixty sites (two prehistoric/historic sites, 47 prehistoric sites, 11 historic sites) have not been evaluated. One site, the Plank Road, is

a California Historical Landmark, is listed on the California Register of Historical Resources, and has been nominated for listing on the NRHP. Site forms are missing in 15 cases. It is assumed that these sites have not been evaluated.

3.9.6 Historically Significant Linear Features

Linear features in the Planning Area consist of historic roads, railroad, and canals.

3.9.6.1 Historic Roads

Old Highway 80 (CA-IMP-8356) was one of the earliest transcontinental highways. This two-lane highway was designated as a route in the 1920s and connected San Diego, California, to Savannah, Georgia. The segment of Highway 80 that runs through Imperial County was completed in 1926. Parts of Old Highway 80 are NRHP-eligible. After World War II, an interstate freeway system was built that is still used today. Old Highway 80 was replaced in Imperial Valley in 1964. Portions of Old Highway 80 remain; two segments are located within the Planning Area and consist of an asphalt and gravel road in moderately good condition. The segments have been recommended not NRHP-eligible (Apple et al. 2006).

The Yuma to Coachella Road was an 1857 wagon road along the east side of the Southern Pacific Railroad. Water stops along this road were Mammoth Tank, Frink's Spring, the Cienegas, and Dos Palmas (Wray 2004).

A discussion of the historic Plank Road through the ISD will be discussed below in Section 3.9.7.

3.9.6.2 Historic Canals

The All-American Canal (CA-IMP-7130H) was constructed between 1934 and 1940 to transport water from the Colorado River to Imperial Valley. It was part of the Boulder Canyon Act that authorized a noteworthy water reclamation project including the Boulder Dam, Imperial Dam and Desilting Works, the All-American Canal, and the Coachella Branch of the All-American Canal. The All-American Canal is 82 miles long and runs from the Imperial Dam Desilting Works west to the West Side Main Canal. It has been recommended NRHP-eligible under criterion A because of its association with the agricultural development and settlement of the Imperial and Coachella valleys. The areas served by the canal have become one of the richest and most important agricultural areas in the US since the completion of the canal in 1938 (Queen 1999). The canal has also been recommended NRHP-eligible under criterion C as part of a district. The All-American Canal Project System is a district that is significant for its engineering construction (Schaefer and O'Neill 2001).

The Coachella Canal, including the Old Coachella Canal (CA-IMP-7658), was built between 1935 and 1948 as a branch of the All-American Canal. Its purpose was to deliver water to the northeast portion of Imperial Valley and to the Coachella Valley. The total length of the canal is 122 miles. The Old Coachella Canal is a segment of the Coachella Canal that was abandoned in 1982 when a concrete-lined channel was built adjacent to it. The Old Coachella Canal is the first 49 miles of the canal. The last segment (38 miles) of the canal from North Shore to Lake Cahuilla was lined with concrete to prevent water loss (Schaefer and Ghabhláin 2003).

The Coachella Canal, including the abandoned segment, has been recommended NRHP-eligible under criterion A because of its association with one of the largest and most ambitious water reclamation projects in the US involving Colorado River water. Other parts of the reclamation project include Boulder Dam, Imperial Dam, and the All-American Canal. This project allowed for major agricultural and population growth for the western states after World War II. In addition, the Coachella Canal was a public works program from the 1920s Progressive Era and represents the federal government's involvement with economic development under the New Deal in the 1930s (Schaefer and O'Neill 1998; Schaefer and Ghabhláin 2003). The Coachella Canal is also NRHP-eligible under criterion C because the design and dimensions of the earth-lined and concrete-lined sections of the canal are typical of canal construction during the 1930s and 1940s. It is recommended significant at a local and regional level, but not at a national level. In addition, Schaefer and Ghabhláin (2003) recommend that the canal is NRHP-eligible as part of a district with the Imperial Dam and Desilting Works, the All-American Canal, and the Coachella Canal.

3.9.6.3 Historic Railroad

The segment of Southern Pacific Railroad (now UPRR; CA-IMP-3424H/CA-RIV-6381H) that runs through the Planning Area was constructed in the 1870s. The Southern Pacific Railroad stretches from El Paso, Texas to San Francisco, California. Mainline sites or stops along the railroad from northwest to southeast (within the Planning Area) included Tortuga, Amos (also known as Mammoth), Acolita, Mesquite, Glamis, Ruthven, Drylyn/Clyde, Cactus (late), Cactus (early), Ogilby, and Pilot Knob (Wray 2004). Amos had its own post office in 1920 and an associated historic cemetery from the railroad construction period still exits. Glamis had a store and school for railroad workers. It also has an associated historic cemetery from the railroad construction period. Glamis has experienced an economic resurgence as a result of the popularity of the ISD as a recreation area. It has a year-round store/gas station and numerous temporary vendors during the winter recreation season. Acolita had a large concrete cistern for water brought in by railcar. Ogilby is the junction for a road to the Cargo Muchacho Mountains mining areas to the northeast. The railroad access at Ogilby was heavily used in the 1880s and 1890s by the town of Hedges and the American Girl Mine at Obregon. A

store and school remained until 1940. Foundations and a cemetery still exist (Wray 2004). A few of the old structures and the water tank remain standing at Pilot Knob.

The Ogilby Station (CA-IMP-8191H) was established in 1877 as a railroad stop equipped to supply water to for the steam-powered engines. Archival research and oral history was conducted as part of the mitigation for the North Baja Pipeline project (Cleland et al. 2003). The town of Ogilby was located north and south of the railroad tracks and served the Tumco-Hedges mining district. By 1880, Ogilby had its first post office, which closed after four months, reopened in 1890, and discontinued again in 1895. The final post office closed in 1942. A school was established in the 1920s and closed in 1946. The town of Ogilby was abandoned in the 1950s and the remaining buildings were demolished, leaving the cemetery behind. The archaeological remains have been recommended eligible for inclusion on the NRHP. A fabrication plant in Ogilby produced the planks for the second historic Plank Road in 1916. Three 1-by-1-meter units were excavated in order to investigate two features which were discovered during construction monitoring for the North Baja Pipeline project. The majority of recovered artifacts consisted of glass. Other artifact types included metal, brick, buttons, historic ceramics, rubber, charcoal, and bone fragments (Cleland et al. 2003).

3.9.7 California Historic Landmarks

The California Historic Landmark program is designed to recognize places of California heritage significance with stone monuments and bronze plaques along roadways. Most of the commemorative monuments are actually located on California Department of Transportation (CALTRANS) or county road ROWs, even those within BLM-administered lands. California Historic Landmarks are buildings or sites that have been approved for designation by the local county board of supervisors or city council and recommended by the State Historical Resources Board.

To be eligible for designation as a Historic Landmark, a property must be:

- The first, last, only, or most significant of its type in the state or within a large geographic region (northern, central, or southern California)
- Associated with an individual or group having a profound influence on the history of California
- A prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer or master builder

The only listed California Historic Landmark is within the Planning Area is the historic Plank Road through the ISD. It is located at the southern end of the Planning Area.

The Plank Road (No. 845 [CA-IMP-4764H]) was constructed by the California Highway Commission in 1916 to provide vehicle access across the dunes. Prior to this access across the Planning Area, travelers headed south into Mexico or north through Mammoth Wash to go around the Algodones Dunes. The Plank Road was 7 miles long and constructed of wooden crossties, which replaced an earlier road of parallel planks laid down in 1915 (PHR Associates and Carrico 1989). The method of construction was an experiment previously untried. The engineering techniques used were unusual (National Register Form). The Plank Road was abandoned in 1926 when it was replaced by Highway 80, which was in turn later replaced by I-8. Only segments of the Plank Road remain today. Two of the segments contain wood planks lashed with metal straps and tarred and three segments have only the tarring. It listed as a California Landmark and is recommended NRHP-eligible under criteria A and C, but is currently not listed on the NRHP. The Plank Road is associated with opening a more direct southern travel route and with the competition between Los Angeles and San Diego for the Pacific Coast terminus of a transcontinental highway. The opening of the travel route eased access to shipping for valley farmers and contributed to the agricultural growth of the Imperial Valley.

3.10 Paleontological Resources

Paleontological resources are the fossilized evidence of past life found in the geologic record. Despite the tremendous volume of sedimentary rock deposits preserved worldwide and the enormous number of organisms that have lived through time, preservation of plant or animal remains as fossils is an extremely rare occurrence. Because of the infrequency of fossil preservation, fossils—particularly vertebrate fossils—are considered to be nonrenewable resources. Because of their rarity and because of the scientific information they can provide, fossils are highly significant records of ancient life. They can provide information about the interrelationships of living organisms, their ancestry, development, and change through time, and their former distribution. Progressive morphologic changes observed in fossil lineages may provide critical information on the evolutionary process itself—that is, the ways in which new species arise and adapt to changing environmental circumstances. Fossils can also serve as important guides to the ages of the rocks and sediments in which they are contained and may prove useful in determining the temporal relationships of rock deposits from one area to another and the timing of geologic events. Time scales established by fossils provide chronologic frameworks for geologic studies of all kinds.

Significant fossils include all vertebrate fossil remains (body and trace fossils) and plant and invertebrate fossils determined to be scientifically unique. Paleontological resources (fossils) include the bones, teeth, body remains, traces, or imprints of plants and animals preserved in the earth since a past geologic time. All fossils offer scientific information, but not all fossils offer significant scientific information. Among paleontologists, fossils

generally are considered scientifically significant if they are unique, unusual, rare, diagnostically or stratigraphically important, or add to the existing body of knowledge in a specific area of science. Most fossils occur in sedimentary rock formations. Although experienced paleontologists generally can predict which formations will contain fossils and what types of fossils will be found based on the age of the formation and its depositional environment, predicting the exact location where fossils will be found without field surveys is usually not possible.

BLM has classified the Planning Area using the probable fossil yield classification (PFYC). This planning tool classifies geologic formations according to the probability of yielding paleontological resources that could be of concern to land management. The following classification is based largely on how likely a geologic unit is to contain vertebrate and significant invertebrate fossils. While PFYC is based on probabilities and not certainties or known locations, there will be exceptions to each classification based on the criterion used as the basis. Where the presence or absence of vertebrate and significant invertebrate fossils is not known in a geologic unit conducive to the presence of fossils, existing protocols allow for inventory, assessments, and mitigation of potential paleontological resource impacts on a case-by-case basis.

All lands within the Planning Area are classified, as follows, based on their potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. These classifications are based on geology of the area and from existing resource data (Rogers 1992). These classifications are ranked by class as follows:

Class 1 (low sensitivity). Igneous and metamorphic geologic units or units with highly disturbed preservational environments not likely to contain recognizable fossil remains. Management concern is negligible for class 1 resources, and mitigation requirements are rare.

Class 2 (moderate sensitivity). Sedimentary geologic units not likely to contain vertebrate fossils or significant non-vertebrate fossils. Management concern is low for class 2 resources, and mitigation requirements are not likely.

Class 3 (moderate sensitivity). Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence or units of unknown fossil potential. Management concern may extend across the entire range of management. Ground-disturbing activities require sufficient mitigation to determine whether significant resources occur in the area of the proposed action.

Class 4 (high sensitivity). Class 4 units are class 5 units with lowered risk of human-caused adverse impacts or lowered risk of natural degradation. Ground-disturbing activities require assessment to determine whether significant resources occur in the area of the proposed action. Mitigation may include full monitoring of significant localities.

Class 5 (high sensitivity). Highly fossiliferous geologic units that regularly produce vertebrate fossils or significant non-vertebrate fossils that are at risk of natural degradation or human-caused adverse impacts. Class 5 areas receive the highest level of management focus. Mitigation of ground-disturbing actions is required and may be intense. Areas of special interest are designated and intensely managed.

All lands within the Planning Area fall within class 2 (Patricia Hester, e-mail message, March 19, 2009). Since the dunes are unconsolidated sand, they are not likely to contain fossil resources. A search of the University of California Museum of Paleontology database revealed no documented fossil resources within the Planning Area.

In general, the collection and preservation of fossils found on public lands uses existing regulations and policies as detailed in BLM Handbook H 3720-1. Common invertebrate and plant fossils are available for non-commercial hobby collecting (43 CFR 8360). Paleontological resource use permits are required for the collection of significant fossils. All vertebrate fossils and, in rare cases, invertebrate or plant fossils are deemed significant under current policy. The significance of invertebrate or plant localities is treated on a case-by-case basis, but generally is more widespread and predictable.

3.11 Visual Resources

Visual resources are managed by controlling how the landscape is altered from the natural appearance and by introducing or maintaining variety in the "seen" area. Visual variety contributes to high-quality recreation experiences. Visual variety at the Planning Area is evidenced by contrasts in the ever-changing sand dunes and vegetation. Most of the landscape appears natural (undisturbed) with very few human-made landscape alterations. Many opportunities exist for undisturbed views that have little human intervention. The composition of the dune formations, fine textures, and color contrast between the darker vegetation and light sand is what gives the Planning Area its distinctive landscape character.

3.11.1 Regulatory Framework

The FLPMA of 1976 requires BLM to protect the quality of scenic values on public lands (43 USC 1701). To achieve that goal, BLM has developed and uses an analytical process that identifies, sets, and meets objectives for maintaining scenic values and visual quality—the VRM System. This standard protocol is used for the inventory and analysis of visual resource values. The VRM system functions in two ways: first, in the inventory of visual resources and second, in their management (BLM 1984a).

The inventory stage involves identifying the visual resources of a given land area and assigning an inventory class to it. The inventory process involves rating the visual appeal

of a tract of land, measuring public concern for its scenic quality, and determining whether the tract of land is visible from travel routes or observation points. The process is described in detail in BLM Manual H-8410-1—*Visual Resource Inventory* (1984b). Class I is assigned to WAs and WSAs, where the current management situation requires maintaining a natural environment essentially unaltered by human actions, even where exceptional scenic values are not exhibited.

Based on three factors—scenic quality, sensitivity, and visibility/distance zones—all other BLM-administered lands are assigned one of four visual resource inventory classes (Table 3-11). These inventory classes represent the relative value of visual resources, classes I and II being the most valued, class III representing a moderate value, and class IV being of least scenic value.

TABLE 3-11
VISUAL RESOURCE INVENTORY CLASSIFICATION MATRIX

Special Areas		Visual Sensitivity Level						
		High			Medium			Low
		I	I	I	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II
	B	II	III	III*	III	IV	IV	IV
				IV*				
	C	III	IV	IV	IV	IV	IV	IV
		f/m	b	s/s	f/m	b	s/s	s/s
		Distance Zones						

Source: BLM Manual H-8410-1
Key to Distance Zones:
f/m=foreground/middleground
b=background
s/s=seldom seen
* If adjacent areas are class III or lower, assign class III; if higher, assign class IV.

The results of the visual resource inventory, the Visual Resource Inventory Classification, provide the basis for considering visual values in the BLM's RAMP process. It is the RAMP development process that assigns the management classes.

These management classes describe the Visual Management objectives of a given area, ranging from preservation to major modification, as well as the different degrees of modification to the basic elements of the landscape (form, line, color, texture) that are allowed.

The BLM-established management objectives for each VRM class are shown in Table 3-12.

TABLE 3-12
VISUAL RESOURCE MANAGEMENT OBJECTIVES BY CLASS

Visual Resource Class	Visual Management Objective
Class I	The objective of this class is to **preserve** the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II	The objective of this class is to **retain** the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III	The objective of this class is to **partially retain** the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV	The objective of this class is to provide for management activities which require **major modification** of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Source: BLM Manual H-8410-1

During the RAMP process, the inventory class assignments and/or boundaries may be adjusted as necessary to reflect the resource allocation and management decisions made in the RAMP. Under different RAMP alternatives, VRM Classifications may vary according to the underlying alternative resource management priorities and strategies. Alternative visual management scenarios are discussed further in Section 2.3.11.3.

3.11.2 Existing Visual Resource Management

The BLM had not previously performed a formal inventory of lands within the Planning Area, nor had it given those lands relative visual ratings (management classifications) according to the VRM system. Rather, the ECFO manages the lands within the Planning Area according to the MUCs listed in the CDCA Plan. The VRM Classes were assigned based on review of CDCA Plan MUCs, the landscape, and recreational uses of each area. The VRM Classes determined to be associated with each MUC are listed in Table 3-13 below.

TABLE 3-13
VRM CLASSES ASSOCIATED WITH THE MULTIPLE-USE CLASSES ASSIGNED TO THE PLANNING AREA

Assigned MUC[1]	Associated VRM Class
Class I Intensive Use	VRM Class IV
Class M Moderate Use	VRM Class III
Class L Limited Use	VRM Class II
Class C Controlled Use	VRM Class I

[1] California Desert Conservation Area listings

Table 3-14 provides a general overall VRM classification of the Planning Area.

TABLE 3-14
VRM CLASSES OF OHV RECREATION AND CAMPING AREAS

VRM Class I	VRM Class II	VRM Class III	VRM Class IV
North Algodones Dunes Wilderness	Dune Buggy Flats area	Glamis area	Mammoth Wash area
	Large Central Closure area		Buttercup area
	Ogilby area		Gecko area

A new VRM inventory was completed in January of 2009 in preparation for the RAMP effort. Results of this inventory are presented in Section 3.11.4 below.

3.11.3 Visual Resources of the Planning Area

The following description of the visual resources of the landscape at various areas within the Planning Area is based on informal site visits conducted by ECFO resource personnel on October 16 and 17, 2001. The climatic conditions during the site visits included cloudy skies, no wind, and temperatures estimated to be in the 90°F range. The Planning Area is a mostly undeveloped area consisting of sand dunes ranging in elevation from approximately 100 to 640 feet, depending on location within the dunes. The differing shapes of the dune forms add interest to the landscape. The homogeneous sand color and the fine sand texture provide a strong contrast to the blue sky and add visual interest to the view. Certain dunes, such as Competition Hill, have horizontal ridges across the dune hills. These ridges are known as "whoop-de-dos." They add texture to the visual landscape, as do the vehicle tire tracks on the dunes.

Development within the Planning Area includes the Cahuilla Ranger Station, the Buttercup Ranger Station, the vendor areas, the Glamis Beach Store, and the development at certain campgrounds (including kiosks and bathrooms). Other human-

made development is concentrated at or near the boundaries of the Planning Area boundary. This includes: the UPRR tracks and aboveground pipeline markers that exist along the eastern boundary of the SRMA; overhead electric distribution lines; New Coachella Canal that exists along the western edge; SR-78, which is a major two-lane road that crosses the Planning Area at the southern edge of the North Algodones Dunes Wilderness; I-8, a major four-lane interstate highway that crosses the Planning Area near the southern edge; All-American Canal, which parallels the north side of I-8; high-voltage electric transmission line development, which also parallels I-8; and a communications tower, which is located near the Ogilby Camp Area. This development near the Planning Area boundary reflects the character of an urban developed area.

The ISD SRMA is open year-round; however, due to high summer temperatures, the highest use tends to occur from October through Easter of each year. In addition, use on weekdays is minimal, and use on most weekends is moderate. The peak season is concentrated into six holidays: Halloween, Thanksgiving, New Year's Eve and Day, Martin Luther King Day, Presidents' Day, and Easter.

Although OHV recreation occurs throughout the open areas of the Planning Area, certain areas receive higher levels of use, such as Osborne Overlook, Competition Hill, Oldsmobile Hill, Brawley Slide Hill, Patton Valley, Test Hill, and Plank Road. During the 2001 site visits, only a few recreationists were present at these locations. Views of these areas revealed large, open expanses of land (sand dunes and the flat open, sandy areas). The areas appeared relatively pristine, lacking both much human-made development and signs of heavy recreation use. Vehicle tire tracks and boundary posts were the only signs of use/development across the dunes. The heavy use that occurs at these areas at peak times reflects the BLM's VRM class IV management of these areas.

Mammoth Wash, at the northern end of the Planning Area, receives minimal use due to its remoteness. This area has dunes that are smaller than those occurring further south, so less OHV recreation opportunity exists there. This northern area has private land interspersed with BLM land. Grapefruit orchards abut the dunes adding color, texture, line, and form variety to the dune landscape.

Camping by OHV recreationists is concentrated at the Gecko Campground, Keyhole Campground, Roadrunner Campground, the Washes, Ogilby Camp Area, Buttercup Campground, Midway Campground Dune Buggy Flats Campground, and Grays Well Campground. During the site visit, these camp areas appeared to be vacant, vast expanses of level sand, some of which had restroom buildings and trash dumpsters, but no other development was visible. These areas also appeared relatively pristine, except for the restroom and trash facilities and the signage that exists at certain areas. However, photographs taken during peak-use weekends show the camping areas crowded by recreational vehicles, OHVs, camping equipment, and recreationists, which together result in a strong visual contrast to what was seen during the site visits. Site visits during peak-use weekends and review of these photographs provide a more

accurate characterization of the intensive use that occurs within these VRM class IV areas.

The Cahuilla Ranger Station, located just south of SR-78 on Gecko Road, consists of a ranger station, small medical trailer, garage, and a fenced equipment/vehicle storage yard. There is also a vendor concessionaire area on Gecko Road, which was mostly vacant at the time of the site visits. One vendor is present year-round. The presence of vendors in this area during the peak-use times of the year reflects a developed character that strongly contrasts with the natural, undeveloped character of the dunes.

Osborne Overlook is located approximately 3 miles east of the Cahuilla Ranger Station on the south side of SR-78. It consists of a gravel parking area where camping is allowed at the southern end, and day use viewing is allowed at the northern end. Views to the east from the overlook are of rolling dunes in the foreground/middleground (i.e., within 3 to 5 miles) and of the Black Mountains in the background. To the north are the North Algodones Dunes Wilderness in the foreground and the Chocolate Mountains in the distance. Views to the west and south are of the dunes.

The Wildlife Viewing Area, near the North Algodones Dunes Wilderness, is the only interpretive area outside of the Cahuilla Ranger Station. The viewing area includes explanatory wildlife and habitat information on interpretive boards. Motorized vehicle use is not allowed or evident beyond the viewing area within the WA.

The Plank Road area provides a historic view of a wood plank road constructed in the early 1900s to allow motorists to cross the desert. Fragments of the Plank Road remain. A small area has been constructed to showcase a replica of the Plank Road, demonstrating to the public how the historic road once appeared. Interpretive information is also displayed at the partially fenced Plank Road area.

Several types of USBP barriers exist along I-8 on its south side to the west of the Buttercup Campground. The purpose of these barriers is to prohibit undocumented immigrants from entering the US from Mexico. A braced, steel beam border fence was constructed along a large portion of the dunes along the border in 2008. Other barriers consist of steel vehicle barricades painted white with red accents. The form, color, and line of these barriers contrast with the dunes and desert landscape; however, this area is also a utility corridor that includes several high-voltage electric towers of varying designs.

The Mesquite Mine (east of the UPRR tracks, at the base of the Chocolate Mountains) is located east of the Planning Area. The mine includes the Mesquite Mine Overlook Trail, a 3-mile-long gravel trail that climbs a hill. It provides benches for resting, interpretive displays along the trail, and wheelchair access for the first portion of the trail. Views from the Mesquite Mine Overlook include the sand dunes, mining area, and tailings. To the southwest, there is an unobstructed view of Oldsmobile Hill.

Views from Ted Kipf Road traveling southeast from the Washes toward Ogilby Road include visible mining scars in the Cargo Muchacho Mountains to the east. The dunes are visible to the west.

3.11.4 VRM Inventory—Scenic Quality Rating Units

The visual resource inventory process performed for this DRAMP included site visits to assess scenic quality, a qualitative evaluation of visual sensitivity, identification of KOPs, identification of cultural modifications in the landscape, and an evaluation of the effects of those modifications on character and quality. The trend in the scenic quality of the Planning Area is relatively stable and this can be ascribed to the amount of sandy terrain throughout the Planning Area, which—coupled with lack of water—has constrained and limited development. However, OHV recreation has been increasing, and the resulting effects can be seen and are expected to continue to increase.

The visual inventory process resulted in the identification, mapping, and evaluation of eight separate Scenic Quality Rating Units (SQRUs) named as follows:

- Large dunes
- Small dunes
- Microphyll woodlands
- Dissected creosote
- Creosote scrub
- High-use areas
- Interstate 8 corridor
- Agricultural area

These SQRUs were delineated based on homogeneity of the landscape features and character; similar visual patterns, form, line, color, texture, and variety; and extent of impacts from human modifications. A Scenic Quality Field Inventory form and Visual Resource Inventory Classification matrix were completed for each of the SQRUs and are included in Appendix K. A high visual sensitivity ranking was assigned to the large dunes, small dunes, and microphyll woodlands, where public expectation for naturalness and scenic quality are highest. A medium visual sensitivity ranking was assigned to the other SQRUs, in which there is generally a somewhat lower expectation for scenic quality and/or a relatively higher tolerance for evidence of impact and human development.

For the purposes of this Visual Inventory effort, it was assumed that KOPs include the roadways within and adjacent to the Planning Area, as well as the BLM-designated places of interest and observation points (e.g., Osborne Overlook, Watchable Wildlife site, Plank Road site). For this reason, the entire Planning Area is considered to be within the foreground/middleground of one or more KOPs.

The SQRUs are shown on Map 3-5 and briefly described in the following subsections.

3.11.4.1 SQRU 1—Large Dunes

The large dunes are the core of an internationally significant scenic landscape. From the interior of these dunes, foreground/middleground views in all directions are of the surrounding dunes that are smooth, rounded hills of fine-textured, light-colored sand. Background views include the distant mountainous terrain to the northeast, east, and southeast, as well as the relatively flat agricultural plane to the west. The rugged sandy terrain restricts use primarily to OHVs (including sand rails and four-wheel-drive vehicles). The majority of the large dunes area contains little or no vegetation and provides little variety in views, but this area presents an interesting landscape that is enhanced by the stark contrast of the dunes against the blue sky. The dunes that have low-lying shrub vegetation scattered across them also provide visual interest due to the contrast in texture and color provided by the vegetation and the color contrast provided by the sky. The dunes are of varying sizes, heights, and shapes due to winds blowing the sand and the patterns caused by OHV recreation. The closed areas and the WA (north of SR-78) appear pristine, with no vehicle tracks visible. The majority of the large dunes have a low level of surface disturbance.

Scenic quality for this unit is rated high (A). The visual sensitivity level of this unit is high due to its recreational use and designation and associated public interest, expectation, and concern for high scenic quality. This SQRU is within foreground/middleground views of dune recreationists, sight-seers and viewers on adjacent roads (e.g., Sand Road, SR-78 and I-8), campers, and from aircraft flights heading east to or west from the San Diego area. A portion is designated as the North Algodones Dunes WA (north of SR-78), for which special consideration is given for the protection of visual values. The Visual Inventory Classes are class I (wilderness) and class II (Map 3-6).

3.11.4.2 SQRU 2—Small Dunes

The small dunes are located on the outer edges of the large dunes. These smaller dunes rise gently from the relatively flat adjacent creosote plains, resulting in a scenic landscape element that provides a visual buffer to the large dunes. The rugged and colorful Chocolate, Cargo Muchacho, and other mountains to the east contrast sharply in form and color, adding visual interest to the area. The higher, larger dunes provide topographic contrast, also adding visual interest to this unit. Valleys and dune bases

contain sparse vegetation; little or no vegetation is found on the small dunes. Microphyll woodlands are located adjacent to the small dunes (meandering between dunes in places) along the eastern portion of the Planning Area, providing additional visual interest. As with the large dunes, the tan color of the dune sand is generally monochromatic, but there are variations in light and shadow throughout the day and brilliant colors at sunrise and sunset. Although evidence of surface disturbance is relatively low on the small dunes, many areas of creosote plains adjacent to the small dunes show high levels of recreational use (primarily OHV and camping).

Scenic quality for this unit is rated high (A). The visual sensitivity level of this unit is relatively high due to its recreational use and adjacency to the large dunes. This area is within foreground/middleground views of dune recreationists, viewers on adjacent roads (Ted Kipf Road and Wash Road, for example), campers, and from aircraft flights heading east to or west from the San Diego area. A portion is designated as the North Algodones Dunes WA (north of SR-78), for which special consideration is given for the protection of visual values. The Visual Inventory Classes are class I (wilderness) and class II (Map 3-6).

3.11.4.3 SQRU 3—Microphyll Woodland

The microphyll woodlands are fingers of higher density vegetation that dissect the relatively sparse creosote plains adjacent to the small dunes on the eastern side of the Planning Area. The woodlands are primarily along washes flowing west from mountains to the east into the small dunes. Increased water availability from storm events and increased soil moisture result in more densely vegetated linear corridors along the washes. The abundance and type of vegetation present in this unit is not characteristic of much of the Planning Area. This unit exhibits color and texture that is not seen in other portions of the Planning Area. The denser vegetation and darker green colors of the microphyll woodlands contrast sharply with the small dunes and add visual interest to the creosote plains. The microphyll woodlands are relatively rare and provide important wildlife habitat not found elsewhere within the Planning Area.

Scenic quality for this unit is rated high (A). The visual sensitivity level of this area is high due to the unique density and diversity of vegetation. This area is within foreground/middleground views of dune recreationists, viewers on adjacent roads (Ted Kipf Road and Wash Road), campers, and from aircraft flights heading east to or west from the San Diego area. A portion is designated as the North Algodones Dunes WA (north of SR-78), for which special consideration is given for the protection of visual values. The Visual Inventory Classes are class I (wilderness) and class II (Map 3-6).

3.11.4.4 SQRU 4—Dissected Creosote

The dissected creosote SQRU is located primarily along the eastern side of the dunes within the Planning Area. This unit consists of a gently sloping plain with a very sparse distribution of creosote. The unit is dissected by washes conveying storm flows from the Chocolate and Cargo Muchacho mountains to the dunes. Increased soil moisture results in "fingers" of high density and higher diversity vegetation (much more diversity of structure and forms) within washes (microphyll woodlands described above).

Scenic quality for this unit is rated medium (B). Visual sensitivity is medium. Many areas within this unit have high visitor use from OHV recreationists camping and riding to the adjacent dunes, particularly during holidays and key weekends. This unit contains few special areas, but is located adjacent to several special management areas such as the North Algodones Dunes Wilderness and those within the larger dunes. This area is within foreground/middleground views of dune recreationists, campers, adjacent roadways, and from aircraft flights heading east to and west from the San Diego area. A portion is designated as the North Algodones Dunes WA (north of SR-78), for which special consideration is given for the protection of visual values. The Visual Inventory Classes are class I (wlderness) and class III (Map 3-6).

3.11.4.5 SQRU 5—Creosote Flats

The creosote flats SQRU is located primarily along the western side of the dunes within the Planning Area. This unit consists of a gently sloping plain with a relatively even and low-to-moderate density and distribution of creosote, with few, if any, washes dissecting the plain. This unit is mostly lacking in trees and ocotillo. The unit is crossed by the New Coachella Canal and canal roadway. Few structures are present overall.

Scenic quality for this unit is rated medium (B). Visual sensitivity is medium. Many areas of this unit have high visitor use from OHV recreationists camping and riding to the adjacent dunes, particularly during holidays and key weekends. This unit contains few special areas, but is located adjacent to the dunes special management area. This area is within foreground/middleground views of dune recreationists, campers, adjacent roadways, and from aircraft flights heading east to and west from the San Diego area. A portion is designated as the North Algodones Dunes WA (north of SR-78), for which special consideration is given for the protection of visual values. The Visual Inventory Classes are class I (wilderness) and class III (Map 3-6).

3.11.4.6 SQRU 6—High-use Areas

Areas receiving the highest visitor use were identified as a separate SQRU. These high-use areas are located along roadways within the Planning Area (south of SR-78, Ted Kipf Road, and Ogilby Road), mostly in relatively flat terrain—either within the dunes or

creosote scrub plains. High-use areas consist primarily of campgrounds and vendor areas. The majority of campers concentrate within these high-use areas, particularly during holidays and key weekends, when thousands of visitors recreate in the dunes. Cultural modification of the high-use areas consists of roadways (some paved), bathroom facilities, level parking areas, signs and kiosks, and vendor areas. The Cahuilla Ranger Station is located off Gecko Road near several high-use campgrounds. Modifications to the landscape generally contrast with the undeveloped/naturalistic high scenic quality of the surrounding dunes.

Scenic quality for this unit is rated low (C). Visual sensitivity is medium. These areas have high visitor use from OHV recreationists camping and riding to the adjacent dunes, as well as vendors. Visitor use is highest during holidays and key weekends. The high-use areas are located either within the dunes (campgrounds off of Gecko Road) or adjacent to the dunes. High-use areas are within foreground/middleground views of dune recreationists (OHV riders), adjacent roadways, and from aircraft flights heading east to and west from the San Diego area. The Visual Inventory Class is class IV (see Map 3-6).

3.11.4.7 SQRU 7—Interstate 8 Corridor

The I-8 corridor was identified as a separate SQRU. It is a very high-use area containing a split 4-lane highway, frontage roads, above- and belowground utility lines, a rest area, and portions of the All-American Canal. There are also several campgrounds within or adjacent to the corridor and the Buttercup Ranger Station (south of I-8 near the Grays Well Road exit). Vegetation within the corridor is minimal, consisting primarily of creosote scrub. The dunes are visible from the corridor, adding visual interest. The recently completed US-Mexico border fence (consisting of approximately 15-foot-high steel fencing) is highly visible along some portions of the corridor. During high-use periods, hundreds of recreational vehicles (campers and OHVs) may be seen adjacent to the corridor.

Scenic quality for this unit is rated low (C). Visual sensitivity is medium. These areas have high visitor use from OHV recreationists camping and riding to the adjacent dunes, as well as vendors. Visitor use is highest during holidays and key weekends. The corridor has relatively high volumes of interstate traffic and contains several above- and belowground utility lines. High-use areas are within foreground/middleground views of dune recreationists (OHV riders), adjacent roadways, and from aircraft flights heading east to and west from the San Diego area. The Visual Inventory Class is class IV (see Map 3-6).

3.11.4.8 SQRU 8—Agricultural Area

An agricultural area located within the Planning Area was identified as a separate SQRU. The agricultural area located in the northern portion of the Planning Area consists primarily of orchard trees. Trees are evenly spaced within blocks, with access roads between and surrounding orchard blocks. Blocks seem to be arranged at an angle to the dunes located to the east. The dark green of tree canopies contrasts strongly with the light tans of the dunes. A large wash (Mammoth Wash) dissects the central portion of the orchard blocks from northeast to southwest. The Coachella Canal dissects the orchards from south to north. Modifications to the landscape generally contrast with the high scenic quality of the adjacent dunes.

Scenic quality for this unit is rated low (C). Visual sensitivity is medium. The agricultural area has a very high level of cultural modification (planting of orchard trees, ongoing maintenance and harvesting, existence of roads). Recreationists camp and ride OHVs east of the agricultural fields; however, use is lighter in this area as opposed to areas south of SR-78. The agricultural area unit is within foreground/middleground views of campers, dune recreationists (OHV riders), adjacent roadways, and from aircraft flights heading east to and west from the San Diego area. The Visual Inventory Class is class IV (see Map 3.6).

3.11.5 Summary of Visual Inventory Classification

A summary of the inventory information is shown in Table 3-15. The ratings assigned for Scenic Quality, Visual Sensitivity, Distance Zone, and the resulting Visual Inventory Class for each SQRU are specified.

3.12 Special Designations

Existing special designations within the Planning Area include one congressionally designated WA and three ACECs. Other BLM-supported special designations that currently do not exist within the Planning Area include WSAs, National Scenic Byways, National Back Country Byways, National Scenic Trails, National Historic Trails, and Wild and Scenic Rivers. Map 3-7 shows the Special Designations in the Planning Area.

TABLE 3-15
VISUAL RESOURCE INVENTORY SUMMARY

Scenic Quality Rating Unit	Inventory Area	Scenic Quality Rating Unit	Scenic Quality A, B, C	Sensitivity H M L	Distance Zones F M B	Inventory* Class
Large Dunes	Central portion of Planning Area running entire length from north to south	SQRU-1	A	H	F-M	I & II
Small Dunes	Outside edge of large dunes	SQRU-2	A	H	F-M	I & II
Microphyll Woodlands	Eastern portion of Planning Area, adjacent to small dunes	SQRU-3	A	H	F-M	I & II
Dissected Creosote	Eastern portion of the Planning Area	SQRU-4	B	M	F-M	I & III
Creosote Flats	Primarily within the western portion of the Planning Area	SQRU-5	B	M	F-M	I & III
High-use Areas	Off of roadways such as Gecko Road, SR 78, and Ogilby Road	SQRU-6	C	M	F-M	IV
Interstate 8 Corridor	Highway and utility line corridor in southern portion of the Planning Area	SQRU-7	C	M	F-M	IV
Agricultural Area	Located adjacent to the dunes in the northwestern portion of the Planning Area	SQRU-8	C	M	F-M	IV

*Note: Management Class assignments may vary from Inventory Class. WAs and WSAs are assigned Inventory class I and managed by class I objectives by national BLM policy (BLM 2000) regardless of scenic value, because the objective is to manage these areas to maintain their natural-appearing landscape.

3.12.1 Wilderness Areas

The BLM manages the congressionally designated WA within the Planning Area consistent with the CDPA of 1994, the administrative instruments (e.g., regulations, policies) from that statute, and other applicable federal statutes. These instruments identified management direction for these lands with respect to specific uses that may occur within wilderness, as well as overall goals for lands designated. Of particular importance is the clear Congressional intent that wilderness designations not lead to the creation of "buffer zones" around wilderness boundaries. In and of themselves, non-wilderness activities visible or audible from wilderness are not to be precluded up to such boundaries. The FLPMA management standard for WAs is that there be no unnecessary or undue degradation, which is largely defined by the CDPA and Wilderness Act.

The Planning Area contains the North Algodones Dunes WA administered by the BLM. Travel in WAs is limited to foot or equestrian conveyance. Motorized vehicles, bicycles, or any other form of mechanized equipment are prohibited in these areas to protect the solitude and primitive nature of these special places.

3.12.1.1 North Algodones Dunes Wilderness Area

The North Algodones Dunes WA was designated in the CDCA Plan through the California Desert Protection Act of 1994. The North Algodones Dunes WA extends from the east side of the Coachella Canal to Niland/Glamis Road, and north of SR-78 to the Mammoth Wash open area. The WA is divided into two distinct zones: the primary dunes on the west, and the secondary dunes on the east. The secondary dunes contain basins or flats which support a variety of vegetation and wildlife due to ephemeral flows. The flat-tailed horned lizard, desert tortoise, and Colorado desert fringe-toed lizard are known to occur, as well as the Andrews dune scarab beetle (BLM 1990). Mule deer are known to use the microphyll woodlands associated with washes as corridors through the North Algodones Dunes WA. It is thought that the Yuma puma has followed the deer into the woodland to prey on the mule deer.

This WA is closed permanently to OHVs and other mechanized use, with hiking and horseback access permitted. Primitive camping is allowed, but developed camping sites or facilities are not available. No commercial uses are permitted, and the use of motorized vehicles of any kind is prohibited. Most use in the WA takes the form of short photographic and sightseeing walks from SR-78, although hiking, backpacking, and nature study trips also occur. BLM also conducts guided hikes into the North Algodones Dunes WA for the local community and school field trips as staffing allows. Solitude and primitive recreation are the primary land uses within the wilderness.

Wilderness Values

- **Naturalness.** Essentially untrammeled by humans, the sole signs of human activity within the WA are five wildlife guzzlers. These guzzlers have been concealed as to be unnoticeable within the area as a whole.

- **Solitude.** Opportunities for solitude may be enhanced by the challenge of hiking into the dunes (which may limit use) as well as the natural formations and vegetative cover within the dunes, which has the potential to shield recreationists' line of sight.

- **Primitive Recreation.** Primitive recreation opportunities within the WA include hiking, backpacking, and nature study trips.

3.12.2 Areas of Critical Environmental Concern

To qualify as an ACEC, an area must meet FLPMA relevance and importance criteria. A natural or cultural resource may be determined relevant if special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; or other natural systems or processes; or to protect life and safety from natural hazards. A natural or cultural resource may be found to be important if it has qualities that give it special worth, consequence, meaning, distinctiveness or cause for concern (e.g., if the resource is endangered, threatened, or vulnerable; or if the resource is fragile, sensitive, rare, or irreplaceable). The CDCA Plan states that the goals of the ACEC program are to:

> (1) Identify and protect the significant natural and cultural resources requiring special management attention found on BLM-administered lands in the CDCA;
>
> (2) Provide for other uses in the designated areas, compatible with the protection and enhancement of the significant natural and cultural resources; and
>
> (3) Systematically monitor the preservation of the significant natural and cultural resources on BLM-administered lands, and the compatibility of other allowed uses with these resources. (BLM 1980)

Within the Planning Area, there are three ACECs designated for natural and cultural resource values: East Mesa ACEC, Plank Road ACEC, and North Algodones Dunes ACEC (Table 3-16). Each ACEC has its own management plan.

TABLE 3-16
ACECS IN THE PLANNING AREA

ACEC[1]	Total BLM-administered Acres
East Mesa	6,454
Plank Road	299
North Algodones Dunes	26,098

[1]BLM's land use decisions and management actions only apply to BLM-administered lands within the ACEC.

3.12.2.1 East Mesa ACEC

The Planning Area includes a portion of the East Mesa ACEC, located adjacent to the southwest corner of the Planning Area. This ACEC was established in 1980 to protect the flat-tailed horned lizard (*Phrynosoma mcallii*) and two rare plant species: Thurber's pilostyles (*Pilostyles thurberi*) and Salton milk-vetch (*Astragalus crotalariae)*, as well as cultural resources associated with the Lake Cahuilla shoreline.

3.12.2.2 Plank Road ACEC

In 1985, the BLM designated the Plank Road an ACEC. Plank Road, located in the southern portion of the Planning Area, is a historic cultural resource. The Plank Road ACEC contains the last intact remnant of what was once an important east-west vehicle route across the ISD.

3.12.2.3 North Algodones Dunes ACEC

The North Algodones Dunes ACEC was designated in 1989/1990 by CDCA Plan Amendment 13. Under the California BLM "umbrella" concept, all special areas are also designated as ACECs to help eliminate the proliferation of terms. It was determined that the dune system and associated resources within the North Algodones Dunes meet the ACEC criteria of relevance and importance.

3.13 Mineral Resources

The principal mineral resources in the Planning Area are sand and gravel and geothermal. The blow sand of the main dune system is occasionally used for fill material. Alluvial sand and gravel deposits east of Glamis are extracted for road base material. All sand and gravel sales activity is found on the Glamis-Boardmanville class M lands.

There is one mining claim in the Planning Area. No mineral extraction has occurred in this area, and potential for practical extraction appears to be low (BLM 1980 and 1987).

3.13.1 Mineral Resource Potential

The Planning Area is located along the eastern boundary of the Salton Trough, southeast of the Salton Sea. Within this area, the Salton Trough is an active, major structural and topographic basin extending from the upper Coachella Valley south through the Gulf of California. The Salton Trough is located at the southern termination of the San Andreas transform fault system, believed to be one of the few places where oceanic rifting is actively imposed on continental crust resulting in thermal activity, faulting, and associated seismicity and volcanism. This trough and the bounding San Andreas and San Jacinto fault zones outline the Colorado Desert province. The Planning Area is situated below the terminus of the San Andreas Fault zone within and east of the area of transform faulting.

The Salton Trough is the result of a relative change in direction of the boundary between the East Pacific Rise and North American plate during the late Cenozoic, resulting in apparent rifting through to the Gulf of California. The opening of the trough and the adjacent Gulf of California to the south probably started in Miocene time. Transform movement along the strike slip system south of the current Salton Sea, resulting in apparent rifting, is estimated to have occurred in the Pliocene. This zone of transitional faulting results in faster spreading in the trough and subsequent extension and depression of the surface, widening southward into the Gulf of California.

The 130-mile long landward extension of the trough can be separated into two regions, the northern portion incorporating the Coachella Valley and a southern portion including the Imperial Valley above the US-Mexico border. Significant deltaic sedimentation resulted from discharge of the westerly flowing Colorado River filled and dissected the northern extension of the gulf in the trough from the Imperial Valley, south to the Gulf of California. Periodic episodes of volcanic flows and debris deposits are imprinted within the fluvial sediments. Within the landward part of the trough, sedimentation reaches depths up to 6 kilometers in the Imperial Valley.

The Planning Area is underlain by surficial eolian sand deposits, and by deltaic sands and gravels, and possibly volcanic flow rocks at depth.

3.13.2 Locatable (Metallic and Non-metallic) Minerals

Minerals subject to location under the General Mining Law of 1872 (30 USC 22, et seq.; as amended) include metallic minerals such as gold, silver, copper, lead, zinc, and uranium; non-metallic minerals such as asbestos, barite, gypsum, and mica; and uncommon varieties of stone (43 CFR 3800). The General Mining Law of 1872 allows citizens and those seeking to become citizens of the US the right to enter upon public lands and reserved interests for the purposes of exploration and development of minerals subject to this mining law. Appropriation of a mineral deposit is made by

location of a mining claim. No rights under the mining laws can be exercised by a claimant until a discovery of a valuable mineral deposit has been made within the boundaries of the mining claim.

Exploration and development must be conducted in accordance with all applicable laws, regulations, and policies, and in conformance with the approved land use plan. Restrictions and stipulations may be applied to a proposed activity based on review and analysis by the authorized officer.

All activity is managed under the authority of the regulations at 43 CFR 3809 (public lands and WAs). Authorization is based on the level of disturbance and whether the activity is conducted in a special designation area. Casual use activities such as panning for gold, prospecting, and monumentation of mining claims, are authorized by the regulations where disturbance would be nominal. No approval is required from the authorized officer of the BLM. Where exploration activities would cause more than nominal disturbance and surface disturbance is 5 acres or less, a notice is required to be reviewed by the authorized officer of the BLM to assure that unnecessary or undue degradation would not occur to public lands or resources. A plan of operations is required for surface disturbance greater than 5 acres, in a special area, or for mining activity greater than casual use. A plan of operations must be approved by the authorized officer of the BLM and may be subject to stipulations to assure conformance with the land use plan.

BLM manages to protect sensitive resources by defining protective prescriptions in land use planning that are to be applied in any approval of activities. Where mineral development activity would adversely affect sensitive resource values, the BLM may petition for withdrawal of an area from the operation of the mining laws. Withdrawals greater than 5,000 acres must have congressional review and approval.

3.13.2.1 Potential for Accumulation and Occurrence of Metallic and Non-metallic Minerals

The BLM does not currently have any active approved plans of operation for metallic mining in the Planning Area. There is one mining claim recorded (Appendix L) in BLM-administered lands within the Planning Area. This mining claim is presumably located for placer gold, although no surface mining activity is known from the area. No known activity for nonmetallic/industrial minerals currently occurs in the Planning Area.

3.13.2.2 Potential for the Development of Metallic and Non-metallic/Industrial Minerals

Locatable minerals of interest in the Planning Area are limited to gold. The mineral deposit model for the area is based on the Mesquite Mine, approximately nine miles east

of the Planning Area. The model is defined as disseminated free gold hosted in gneiss and granitic rocks, and quartz veins in either rock unit. Gold mineralization in southeastern Imperial County area is along the upper plate of the Chocolate Mountain thrust zone. East of the recreation area, the thrust zone and upper plate units are exposed at the surface (Mesquite, American Girl, Picacho mines), ranging to many thousands of feet below the surface elsewhere. It is unlikely that this mineralization exists within the economics of open pit mining methods commonly employed and necessary to develop these type deposits in the Planning Area.

The geologic environment is limited to low grade gold lode deposits. Metallic and nonmetallic/industrial minerals have historically been limited to surface mining operations. Potential for development of large-scale open pit metal mines is nonexistent in the Planning Area because the deposits appear to be too deep to access by surface operations in the eastern portion.

Based on the level of activity in the last 20 years and the potential for locatables on BLM-administered lands within the Planning Area, potential future mineral development activity is estimated to be low to nonexistent.

3.13.3 Leasable (Fluid and Solid Energy, and Solid) Minerals

Leasable minerals include fluid energy mineral deposits such as oil, gas, coal bed methane, CO_2, and geothermal resources. Solid energy and or industrial minerals, such as coal, sodium, and potash, are also disposed of from public lands by the BLM through lease. BLM defines geothermal resources as renewable energy fluid minerals that can be developed after obtaining a lease from BLM.

Laws and regulations applicable to federal leasing in the Planning Area include:

- Mineral Leasing Act of 1920 as amended and supplemented
- Acquired Lands Mineral Leasing Act of 1947
- Mining and Minerals Policy Act of 1970
- Geothermal Steam Act of 1970
- Federal Onshore Oil and Gas Leasing Reform Act of 1987
- 43 CFR 3100 (Oil and Gas Leasing)
- 43 CFR 3200 (Geothermal Resources Leasing)
- BLM Manual Series 3100—Onshore Oil and Gas Leasing (and handbooks)

A mineral lease is an agreement affording the right to access and develop mineral resources contained within the boundaries of the leased area in compliance with the lease terms and in conformance with appropriate local, state, and federal laws and regulations. Where information necessary to classify as valuable public lands for minerals subject to the leasing laws, prospecting permits may be authorized before leases would be approved. Where mineral deposits subject to leasing are known to be valuable, BLM may offer to lease through competition. Competitive leasing is required for all oil and gas. Leases are typically termed for 20 years and are extended as long as the leasehold is in production. A payment of an annual lease rental or a royalty for minerals produced is made to the US by the lessee.

In some situations where sensitive resource values occur, a lease may be issued with a NSO requirement. This requirement must assure that the mineral deposit on the lease could be developed by means of off-site development.

A determination that lands are available for leasing represents a commitment to allow surface use under standard terms and conditions unless stipulations constraining development are attached to leases. When applying leasing restrictions, the least restrictive constraint to meet the resource protection objective would be used.

Private leasing of federal mineral estate on lands where the surface is not held by the federal government is done in accordance with federal law, regulations, and policy guidance. The surface owner is notified prior to lease and given the opportunity to comment.

3.13.3.1 Potential for Accumulation and Occurrence of Fluid and Solid Energy, and Solid Leasable Minerals

There is no potential for coal resources or other solid leasable minerals in the Planning Area. The Planning Area is classified as prospectively valuable for oil and gas and geothermal resources.

3.13.3.1.1 Oil and Gas Resource Potential

As of 1987, several oil and gas leases had been issued, mainly in the class L (limited use) area of the central dunes, the Glamis/Gecko Open Area, and in the North Algodones Dunes Wilderness. Leasing took place within the North Algodones Dunes WSA in 1981 and 1982, prior to a moratorium on WSA leasing. Development of oil and gas resources is low due to geologic conditions within the Planning Area. There are no known oil and gas fields, or development of oil and gas resources in Imperial County.

The BLM Manual at 3021.21 B provides the criteria for classifying lands prospectively valuable for oil and gas. These criteria are:

- Minimum 1,000 feet thickness in a sedimentary basin
- Maximum 35,000 feet thickness in a sedimentary basin
- Evidence of oil and gas potential such as seeps, oil or gas shows in well tests, and past or present production. Indirect evidence such as seismic and similarity with other producing rocks can be used in the classification.

The geology of the area does support that there are 1,000 feet of sediments within a sedimentary basin in and around the Planning Area. There are no producing oil or gas wells or known geologic structures of a producing oil field or zone within the Imperial County. The records of wells maintained by Munger or California Division of Oil, Gas, and Geothermal Resources do not show that any oil or gas wells have been drilled within or near the Planning Area (Munger 1992). Development potential for oil and gas resources is low due to unfavorable geologic conditions as provided in BLM Manual 3031.

3.13.3.1.2 Geothermal Resource Potential

Hydrothermal waters occur in the high heat flow regime along fault margins and zones structurally forming the Salton Trough. The thick marine and nonmarine sediments overlaying these systems insulate these hydrothermal areas. Permeable zones within coarser sediments channel thermal waters allowing access by drilling to geothermal fluids.

Based on BLM work in the area, geothermal resource with sufficient temperatures (350 +° F) in the Planning Area may be too deep (greater than 10,000 feet) and the formations are not very permeable at that depth to allow sufficient flow for generating electric power directly. In addition, analytical work completed by various companies in the area support that the closer to SR-78, the water chemistry begins to increase in TDS, yielding a deep, hot, briney, tight resource that most companies are not currently interested in developing.

In developing the Salton Sea area, companies tolerate high TDS (150,000+) because of the enthalpy and permeability of the resource. Geothermal fluids below 7,000 feet from the Salton Sea area can vary in TDS from 7,000 milligrams per liter to over 200,000 milligrams per liter, and can contain some suspended solids. The suspended solids and dissolved solids that precipitate out of solution for a flash-type geothermal plant could present a disposal challenge as they could be hazardous waste (BLM 2007b). Based on deep wells (over 13,000 feet deep) drilled between the East Highline Canal and Brunt's Corner on SR-78 in 1980 and 1981. The geothermal resource was hot, but too deep to be commercial at the time. There has been little interest to develop geothermal resources below 10,000 feet where the rocks have poor permeability, and have a higher TDS than East Mesa.

The area between the East Brawley, Glamis, and East Mesa Known Geothermal Resource Areas (KGRAs), including the Planning Area, is classified by the BLM as being prospectively valuable for geothermal resources. BLM Manual 3021 provides the criteria for classifying lands prospectively valuable for geothermal resources.

Surface manifestations of geothermal resources are not common in this area. There are no warm springs or surface indication of volcanism. Therefore the search for geothermal resources depends on temperature and heat flow measurements from shallow and deep wells and from data generated through indirect methods such as geochemistry, gravity, magnetic, and regional geology.

While the Planning Area is located neither within an area of thermal springs nor an area of Quaternary volcanic activity, there are fault related thermal areas accessed by drilling, as evidenced on the surface by mud holes (pots) near the Salton Sea. In addition, geothermal development is occurring east of the Planning Area, where thermal gradient holes have obtained gradients 40° F higher than ambient temperatures in the area.

Two KGRAs have been identified within the Planning Area, the Glamis KGRA and the Dunes KGRA (Map 3-8). The geothermal potential is considered fair for high temperature electrical power generation and excellent for low temperature applications. The Glamis KGRA occupies a corridor along SR-78, extending up to 2 miles north and 3 miles south of the highway. The northern portion of the Glamis KGRA extends into the North Algodones Dunes Wilderness. The Dunes KGRA occupies 16 sections of East Mesa and adjacent dunes in the southern portion of the Planning Area.

There are no geothermal leases or applications for leases within the Planning Area. No geothermal exploration activity has been approved by the BLM on public lands for temperature gradient holes in the area.

3.13.3.2 Potential for the Development of Fluid and Solid Energy, and Solid Leasable Minerals

Geothermal resources can be classified as low temperature (less than 90°C [194°F]), moderate temperature (90°C–150°C [194–302°F]), and high temperature (greater than 150°C [302°F]). Geothermal resources can provide kinetic energy to drive steam turbines directly, or through heat exchange with other mediums to provide kinetic energy to drive turbines to create electricity or other work. All geothermal uses are influenced by available temperature. High temperature resources are generally used only for electric power generation.

Based on heat flow information, the areas classified by the BLM as KGRAs, have a moderate to high potential for the development of direct geothermal steam applications.

Uses for low and moderate temperature resources can be divided into two categories: direct use and ground-source heat pumps. Direct geothermal use involves using the heat in the water directly (without a heat pump or power plant) for such things as heating of buildings, industrial processes, greenhouses, aquaculture (farming of fish) and resorts. Direct use projects generally use resource temperatures between 38°C (100°F) to 149°C (300°F). Because the Planning Area is remotely located in Imperial County and not within a reasonable distance to transmit geothermal waters for direct heat applications, the potential for heat source application is considered low.

The North Algodones Dunes Wilderness is closed to all geothermal leasing. The remaining ISD SRMA is open to leasing subject to a NSO stipulation. All areas outside the ISD SRMA are open to leasing with appropriate mitigation. Although such activities take place elsewhere in the vicinity of the Planning Area, no geothermal leases have been issued; and no development has taken place within the Planning Area.

No development of oil or gas resources has occurred within the Planning Area.

3.13.4 Salable (Construction Material) Minerals

Salable minerals include construction materials such as sand, gravel, cinders, decorative rock, and building stone as described in 43 CFR 3600. Disposal of mineral materials from BLM-administered lands requires either a sales contract or a free use permit from the appropriate BLM office. Disposal of mineral materials is authorized in accordance with appropriate laws, regulations, and policies in conformance with the approved land use plan and if disposal is determined to be in the public interest. Use of public lands and resources for salable mineral development cannot be allowed if not in the public interest, and if such action would result in unnecessary or undue degradation to public lands or resources.

Laws and regulations applicable to salable minerals on public lands in the Planning Area include:

- Acquired Lands Mineral Leasing Act of 1947
- Mineral Materials Act of 1947 as amended
- FLPMA; and 43 CFR Part 3600
- Surface Resources Act of 1955
- BLM Handbook H3042-1—*Solid Minerals Reclamation Handbook*
- BLM Manual and Handbook 3600

Glamis I and Glamis II, located east of Glamis and north of SR-78, are the only sand and gravel pits operating within the Planning Area. Imperial County Public Works operates the Glamis pits under a BLM free use permit to supply aggregate material for Imperial County road projects. The Glamis pits comprise a total of approximately 1,040 acres and produce from 5,000 to 50,000 cubic yards per year, for a lieftime production of approximately 1.5 million cubic yards (Imperial County n.d).

3.13.4.1 Potential for Accumulation and Occurrence of Construction Materials

The geologic environment within the Planning Area supports the accumulation of quality sand and gravel deposits.

3.13.4.2 Potential for the Development of Construction Materials

The geologic environment within the Planning Area is limited to older shoreline deposits and distal alluvial fan outwash in the far northeastern corner of the area.

There are currently no authorizations on BLM-administered land for mineral materials in the Planning Area.

The local needs for construction materials are proportional to expected growth in Imperial County. Future development of construction materials is limited to areas where available resources are currently being developed. Within the Planning Area, there is a low potential for the occurrence and development of construction materials. There are no current or foreseeable markets identified in the Planning Area where graded aggregate and sand could be developed and sold within the local market from public lands. It is unlikely that quality aggregate exists in the Planning Area as the area is classified as having a low potential for the occurrence or accumulation of aggregate resources.

3.14 Recreation Management

The Planning Area, which contains the ISD SRMA, is a unique recreation resource in the southwestern US. The Planning Area fills a unique and valued niche for providing rural, roaded, natural, and semi-primitive OHV recreation opportunities. A recreation opportunity is commonly defined as the opportunity for a person to participate in a particular activity in a specific setting, in order to realize a preferred type of experience and subsequent benefits. Thus a recreation opportunity is an integrated package of activities, settings, experiences, and benefits. OHV recreation is a broad term that encompasses many types of desired motorized recreation opportunities.

The ISD SRMA encompasses 163,215 acres of BLM-administered lands (Map 2-12). BLM identifies SRMAs where the resources of the public lands attract visitors from one of the three following recreation markets:

- Public lands with a demonstrated *community* recreation-tourism market would be managed as a Community SRMA. A Community SRMA is managed in collaboration with the local community to primarily benefit the local residents.

- Public lands with a demonstrated *destination* recreation-tourism market would be managed as a Destination SRMA. A Destination SRMA is managed as a regional or national destination through collaborative partnerships.

- Public lands with a demonstrated *undeveloped* recreation-tourism market would be managed as an Undeveloped SRMA. An Undeveloped SRMA is managed to intentionally maintain dispersed and undeveloped recreation opportunities.

BLM lands outside of SRMAs must be managed as ERMAs. Recreation management within ERMAs would be limited to custodial actions only. Custodial actions are those necessary to manage dispersed activities, visitor health and safety, and user and resource conflicts. The limited use area (50,615 acres) around the SRMA is an ERMA which falls under NECO and WECO management.

3.14.1 Regulatory Framework

Since its designation, the ISD SRMA has been managed according to mandates set forth in both the 1980 CDCA Plan and the 1976 FLPMA. Among the FLPMA requirements is

> the use of all California desert resources can and should be provided for in a multiple use and sustained yield management plan to conserve these resources for future generations, and to provide present and future use and enjoyment, particularly outdoor recreation uses, including the use, where appropriate, of off-road recreational vehicles (Title VI. SC1781. Sec. 601 [a][4]).

The CDCA Plan of 1980, as amended, provides overall management direction for all public lands in the CDCA.

3.14.2 Fee Program

The SRP fees are periodically revised as required and subject to a public review process. FLREA has replaced the former Recreational Fee Demonstration Program and the Land and Water Conservation Fund Act as the authority for the BLM to collect fees. Additionally, the ECFO collects fees through its SRP program under the authority of FLPMA. The SRP program includes fees collected from competitive events, commercial

activities, organized group events, vending and for special area use. Fees collected from ISD visitors are individual, non-commercial SRPs.

BLM is permitted to retain 100 percent of the new fees collected. The funds generated are used for the operation, maintenance, and any improvements to enhance recreation opportunities and visitor experiences within the subject BLM field office.

3.14.3 Special Recreation Permits

Within the Planning Area, SRPs are required for OHV recreation and vendors. Recreationists may purchase their SRPs through various offsite vendors before they arrive, or they may choose to purchase from onsite vendors or BLM once they arrive at the Planning Area. One permit is needed per primary vehicle. A primary vehicle is any street-legal vehicle used for transportation to the recreation site. A permit is required immediately upon arrival to the Planning Area.

3.14.4 Volunteer Events

ECFO coordinates with volunteer groups throughout the year. There is an annual clean-up day, coordinated by United Desert Gateway, which has occurred over Martin Luther King weekend for the past 12 years. There are also monthly (smaller) clean-up events throughout the recreation season (generally October 1 through May 31). Volunteer camp hosts at Gecko Road, Dune Buggy Flats, and Buttercup Ranger Station live on-site throughout the recreation season to provide information about camping and recreation within the SRMA.

The ECFO often coordinates special volunteer projects to accommodate the needs of service groups such as the Boy Scouts of America. A recent volunteer project was undertaken by an Eagle Scout candidate who landscaped the new Buttercup Ranger Station with native plants.

3.14.5 Other Non-permitted Events (Events Not Requiring a Permit)

Other non-permitted events (allowed events not requiring a permit) that occur within the Planning Area include: backpacking, road bicycling, gathering non-commercial products, hiking/walking/running, horseback riding, nature study, photography, picnicking, viewing of wildlife, interpretive exhibits, and other.

3.14.6 Visitor Use Areas

The Mammoth Wash open area is the most remote OHV recreation area within the Planning Area due to its northern location. The Mammoth Wash open area is about 5

miles long and 2 miles wide and is accessed by Niland–Glamis Road. The distance from the pavement to the staging area is approximately 13 miles. Visitation is usually low in this area. Visitors to this area enjoy the remote location away from the intensively utilized areas of the Planning Area. On weekends during the recreation season (October–May), visitors tend to be residents from the nearby communities of Niland and Calipatria.

The North Algodones Dunes Wilderness is located between the Mammoth Wash open area and SR-78. A watchable wildlife site is located on the Niland-Glamis Road, two miles north of SR-78. The site provides interpretive displays on the wildlife and dunes habitat and also provides an excellent staging area for hikes and school field trips. Hikers into the wilderness can observe indigenous plant and animal species such as the PMV, fringe-toed lizard, mule deer, and other desert animals.

The Glamis/Gecko Area just south of SR-78 is the most intensively utilized OHV recreation area within the Planning Area. Gecko Road is the most developed area, with numerous developed campgrounds and other facilities. Cahuilla Ranger Station, located along Gecko Road, is the headquarters for the ISD SRMA and incident command center for dunes operations. Dispatch services and most of the personnel are based out of the station. Other facilities along Gecko Road include: Gecko Campground; Keyhole Campground; Roadrunner Campground; 10 hardened camping pads; a vendor area; vault toilets; trash facilities; kiosks; and a public telephone.

The Glamis Area (eastside) is undeveloped, contains minimal facilities, and provides for open desert camping. The main access into the Glamis area is via Wash Road, which was historically adjacent to the UPRR tracks and within the UPRR ROW. During the summer of 2009, BLM developed a new Wash Road, located on BLM-managed lands. The new Wash Road, which is adjacent to the URPP ROW, allows for safe and easy access to the camping area known as the Washes. The Glamis and Palo Verde Flats areas are open desert camping areas accessed from SR-78. The BLM provides trash facilities, law enforcement, emergency medical services, and toilet facilities through a combination of funding sources, including fee programs, tax appropriations, and California State Parks Off-highway Motor Vehicle grants. The town of Glamis is privately owned and supports three OHV-oriented businesses. The small settlement of Boardmanville is just east of Wash 10, southeast of Glamis.

The Dune Buggy Flats area is located in the southern portion of the Planning Area and is located north of I-8. The main access into the area is via the Gordons Well exit off I-8 and an improved dirt road. This is an intensive OHV recreation area similar to the Glamis/Gecko area. Facilities located within this area include: kiosks, signs, trash facilities, camp hosts, toilets, and a portable ranger station trailer staffed by BLM staff on holiday weekends.

The area west of the Coachella Canal and adjacent to Gordons Well Road was closed (March 2002) to camping in order to protect the flat-tailed horned lizard (*Phrynosoma*

mcalli) and its habitat. The closure was the result of a BO that mitigates impacts of the Herman Schneider Memorial Bridge. The bridge opened in April 2001 and provides OHV access across the All-American Canal and the shared use (OHV and street-legal vehicles) of the Gordons Well overpass. This allows OHV enthusiasts legal access across I-8 from the Buttercup Valley to the Dune Buggy Flats area. Prior to the bridge construction, there were illegal and dangerous OHV crossings across I-8. The land east of and adjacent to the closed area is privately owned and supports an OHV-oriented private business as well as campgrounds and residences.

Located in the southeastern area of the Planning Area is the Ogilby Camp and Dunes Vista areas. The access to this area is via the Ogilby Road and a dirt/sand road. This area is similar to Mammoth Wash, and there are no facilities or services except BLM patrols. Visitation is low to moderate, with most use occurring on weekends and holidays.

The Buttercup Area is located south of I-8 and north of the US-Mexico border. Buttercup Ranger Station is located here and provides visitor information (maps, education materials, information about the ISD) and emergency medical services. Permits are sold here (there is a kiosk for busy weekends) and the station serves as a law enforcement facility during busy weekends. Grays Well Road provides access to Buttercup, Midway, and the Plank Road camping areas. All three camping areas have vault toilets, and trash facilities. At Plank Road, a metal protective barrier and interpretive signs surround the remnants of the old wooden road that enabled vehicles to cross the ISD in 1915. These areas are all within a 20-minute drive to Yuma, Arizona, where there are shops and a hospital. The Mexico border town of Algodones is also nearby. Visitors can drive street vehicles, park, and then walk across the border to shop and eat.

Near the Planning Area, OHV recreation opportunities are limited to existing trails and routes. There is a network of trails east of the ISD that extends to the Colorado River and north to I-10. There are several WAs and military closures that limit access. Very little OHV recreation opportunity exists directly west of the Planning Area in the East Mesa. The cities of Brawley, Imperial, Holtville, and El Centro lie west of the Planning Area. On the far western side of the valley lie the Ocotillo Wells State Vehicle Recreation Area, Plaster City, and Superstition Mountains. These are open areas with limited use areas around them.

3.14.6.1 Recreation Settings

The majority of the visitation in the Planning Area occurs from October through May. Summer visitation level is low due to extremely high temperatures, although some OHV activity does occur during the summer nights. Typically, the Planning Area experiences high levels of visitation during Halloween, Thanksgiving, New Year's Eve/Day, Martin Luther King Day, Presidents' Day, and Easter. Visitors during these time periods will

experience crowds and noise. Visitor experiences during other times will be of low to moderate levels of visitor interaction.

In addition to the camping areas on the exterior of the Planning Area, visitors have historical congregation sites within the Planning Area, most of which are within the ISD SRMA. Vendor row (alternatively known as the mall) is an area in Glamis Flats that has been historically used for vending of commercial goods and services. The vendors set their sites along the south side of SR-78 between the Glamis Flats off-ramp and the Glamis private property line. Rows often form, facing each other with OHV traffic flowing between the vendors. Additional rows, similar in design, generally follow along the west private property boundary of Glamis. These vendors are permitted through the BLM under the SRP program. The holiday crowds, in conjunction with the vendors, seem to create a carnival atmosphere.

There are also historical gathering areas farther into the dunes. Some of these sites are Competition Hill, the sand drags, Oldsmobile Hill, Patton Valley, Test Hill, and Buttercup Valley. Visitors meet at these locations to test their OHVs, riding skills, and for informal competition. Visitation at these sites peak during different times of the day and are usually busiest during the holidays. The crowds at the sand drags start to gather during the late afternoon and dissipate at dusk, while Oldsmobile Hill, Test Hill, and Buttercup are busy day and night. The crowds at Competition Hill start to gather around eight o'clock in the morning, but there is a county-imposed dusk-to-dawn curfew in effect.

The Planning Area can provide a place for the public to experience solitude and silence or busy crowds and noise. At either end of this spectrum, the visitor has the opportunity to experience vast wide-open spaces once out into the dunes system and away from the roads and campgrounds.

3.14.6.2 Recreation Programs

Recreation programs include developed and dispersed camping, and interpretive/informational/educational services. Although there are developed campgrounds in the Planning Area, there are no delineated camping spaces in any of the campgrounds. Camping is dispersed in both developed and primitive areas of the Planning Area. Interpretive/informational/educational services are provided at Cahuilla Ranger Station through displays and contact with a BLM Park Ranger. There are interpretive panels at the watchable wildlife site and the Plank Road that provide natural and cultural resource information. Informational kiosks are located in several locations throughout the Planning Area near the major ingress/egress points. The private businesses sell maps of the area and also display and handout BLM literature free of charge. BLM staff frequently conducts informational stops at the major entry points and staff distribute literature to visitors as they enter the Planning Area. As staffing allows,

BLM also conducts guided hikes into the North Algodones Dunes Wilderness for the local community and school field trips.

Due to the level of visitation and lack of funding, Imperial County and the BLM work closely together on most medical incidents that occur in the Planning Area. The emergency medical services work has become an integral part of the recreation division in the ECFO. The BLM continues to increase its coordination of emergency medical services with the county each year. In the field, both BLM emergency medical technicians and advanced life support ambulance personnel work together as a team to provide the best level of medical aid possible. The BLM has off-highway 4x4 vehicles, two rescue buggies, and skilled staff to extract accident victims from the Planning Area and transport them to the nearest paramedic ambulance. See Sections 3.17 and 4.17 for more information on law enforcement and rescue.

3.14.6.3 Facilities

Although camping is allowed everywhere within the ISD SRMA, except for the Administrative Closures, the area available for two-wheel drive vehicle overnight camping is limited to the visiting public. The sandy terrain limits access to most of the ISD SRMA for vehicle camping. The acreage that is suitable is primarily along Gecko Road, a portion of the Glamis area, the western side of the Mammoth Wash area, Dune Buggy Flats, the eastern portion of the Ogilby area, and the area adjacent to Grays Well Road in Buttercup.

The Planning Area has two developed campgrounds adjacent to Gecko Road. Gecko Campground is located approximately 3.5 miles south of SR-78. It consists of north and south loops that extend out into a rolling sand dunes area. Roadrunner Campground is located at the terminus of Gecko Road, approximately 5 miles south of SR-78. It consists of one loop that extends out into a flat sandy area. Both campgrounds are the only developed camping areas in the Planning Area. The southern portion of the Roadrunner loop and the northern loop of Gecko Campground are filled in with hard dirt/gravel material to provide camping space. Both campgrounds also provide pit toilets. Two additional developed sites located in the southern portion of the Planning Area (south of I-8) are the Buttercup Campground and Midway Campground.

The BLM has constructed 9 dirt/gravel pads in order to provide additional camping areas for two-wheel drive vehicles. The rest of the camping in the Planning Area is relatively dispersed, although visitors tend to stay in historically used areas such as Glamis, Gecko, Buttercup, and Dunebuggy Flats. These areas provide trash dumpsters, and have pit toilets.

Cahuilla Ranger Station is located on Gecko Road near SR-78. The station provides interpretive services and information to visitors. It also serves as the incident command center during holiday weekends for the BLM and as a contact point for emergency

services. There is also a maintenance shed to accommodate BLM OHVs, emergency vehicles, and supplies.

Buttercup Ranger Station, located in the Buttercup area south of I-8, provides visitor information (maps, education materials, information about the ISD) and emergency medical services. Permits are sold here (there is a kiosk for busy weekends) and the station serves as a law enforcement facility during busy weekends.

3.14.7 Recreation Visitation

The Planning Area is located within a three-hour drive from Los Angeles, Orange County, Riverside, San Diego, and Phoenix. The ISD SRMA is a highly valued and unique recreation resource within the southwestern US for two reasons: 1) it is a sand dune ecosystem of a size and height unparalleled and 2) it fills a unique and valued niche for providing the largest acreage of dune-oriented, motorized recreational opportunities in the US. The ISD SRMA has far more acreage than the 10 other dune areas that are located within 1,500 miles.

Continued population growth in southern California, the expanding popularity of OHV recreation (108% increase since 1980 in California), and a decrease in the acreage available to OHV recreation in the California Desert, has resulted in a steady increase in visitation within the Planning Area. Due to the increased demand for OHV recreation, there has been a need for increased law enforcement.

The Planning Area provides for many types of recreational experiences, with OHV recreation as the dominant activity. The OHV enthusiasts who visit on holiday weekends will experience large crowds, noise, and intensive, 24-hour OHV activity in areas such as Glamis, Gecko, Dune Buggy Flats, and Buttercup. There are other locations within the Planning Area where OHV recreation is less intense on holiday weekends and visitors can have a quieter, less intensive experience (Mammoth Wash or the Ogilby areas). The majority of the opportunity lies during weekdays and non-holiday weekends when a range of recreational settings can accommodate many different types of experiences.

The Planning Area is managed to provide both non-motorized and motorized recreational opportunities to area residents and visitors. In addition to OHV recreation, the Planning Area provides other recreational opportunities including hiking, horseback riding, wildlife and scenery viewing, picnicking, photography, nature study and environmental education, camping, sightseeing, and driving for pleasure. The Planning Area also provides a special niche that produces a particular social experience. It provides wide-open spaces where enthusiasts can seek solitude or a substantially modified natural environment with facilities for a highly intensified motorized recreation experience.

The types of vehicles that are utilized within the Planning Area include OHVs and street-legal vehicles. The vehicle types that can be found include: sand rails, dune buggies, all-terrain vehicles, motorcycles, 4WD pickups, 2WD pickups, sport utility vehicles, and custom built off-road vehicles. Private, law enforcement, military, commercial and rescue aircraft frequently fly over the dunes at low altitudes.

The earliest known annual visitation within the Planning Area was 150,000 in the late 1970s; the number of visits had increased to 225,900 visits in 1985 (BLM 1987). Table 3-17 shows the estimated annual visitation within the Planning Area for fiscal years 2004 through 2008.

TABLE 3-17
PLANNING AREA VISITATION, FY2004-FY2008

Vehicle counter location[1]	FY2004	FY2005	FY2006	FY2007	FY2008
Gecko Road	378,679	371,091	400,474	501,676	454,703
Glamis Flats	182,931	204,239	192,728	206,290	176,246
Mammoth[2]	2,118	2,160	280	427	298
Osborne	28,971	31,442	23,737	25,897	15,152
Wash Road	229,994	225,024	246,187	170,209	203,586
Buttercup	275,363	276,196	275,202	272,437	307,619
Dune Buggy Flats	231,669	245,112	249,529	227,962	181,367
Ogilby	42,905	37,126	45,327	42,303	47,565
Total	1,372,630	1,392,390	1,433,464	1,447,201	1,386,536

[1]Visitation numbers were generated by multiplying vehicle counts by 3.5, the average occupancy per primary vehicle. A visit occurs when one person visits BLM lands to engage in any recreational activity, whether for a few minutes, full day, or more.

[2]Mammoth counts are done by BLM ECFO patrol. Data for FY2006-2008 are limited.

Average annual visitation for fiscal years 2004 through 2008 was estimated at 1.4 million visitors, with peak visitation between October and April. Visitation is unevenly distributed throughout the year, with the highest visitation occurring during the six major holiday weekends (Halloween, Thanksgiving, New Year's, Martin Luther King Day, Presidents' Day, and Easter). The visitation estimates for the major holiday weekends often exceed 100,000 visitors. For example, the average visitation during Thanksgiving weekend for fiscal years 2004 through 2008 was 181,258. During approximately 19 percent of the recreation season (i.e., six weeks out of eight months in the season), 44 percent of the annual visitation occurs.

It is common for a camping party to consist of three or four generations of relatives who have been visiting the area over the years. This provides a sense of tradition, nostalgia, history, intergenerational bonding, and a sense of place attachment.

The Planning Area is open to the public year-round. However, due to high temperatures during the summer months, the recreation season is generally considered to be October 1 through Easter of each year. Because the date of Easter varies from year to year and spring breaks offered by the various schools also differ, the end of the recreation season is considered by BLM to be May 31.

The demand for recreation opportunities peaks on approximately 12.5 percent of the recreation season (October 1 to May 31; see Figure 3.1); that is, there is adequate capacity for those who visit the Planning Area any time other than six major holiday weekends.

The peak use on the holiday weekends results in a change in several important social and managerial attributes of the setting, which then leads to a change in the recreation opportunity being provided. There is a change from providing the rural, roaded natural, and semi-primitive types of recreation opportunity to an urban recreation opportunity.

3.14.8 Management Practices

A variety of practices can be used to manage recreation resources at the SRMA. The BLM has a program that monitors natural, cultural, and recreational resources. The BLM monitors sensitive plants, animals, and habitats throughout the open and closed areas in the dunes. Transects are walked and driven to record plant and animal densities, and hidden automatic cameras are used to photograph animals using water sources in the dunes. Visitor use is monitored through newly installed traffic counters, and has been done in the past with aerial flights during the weekends. The BLM also conducts visitor surveys, in cooperation with special interest groups, to inventory visitor satisfaction and needs. Using these inventories, BLM managers estimate how well they are meeting national, state, and local goals and adjust actions accordingly.

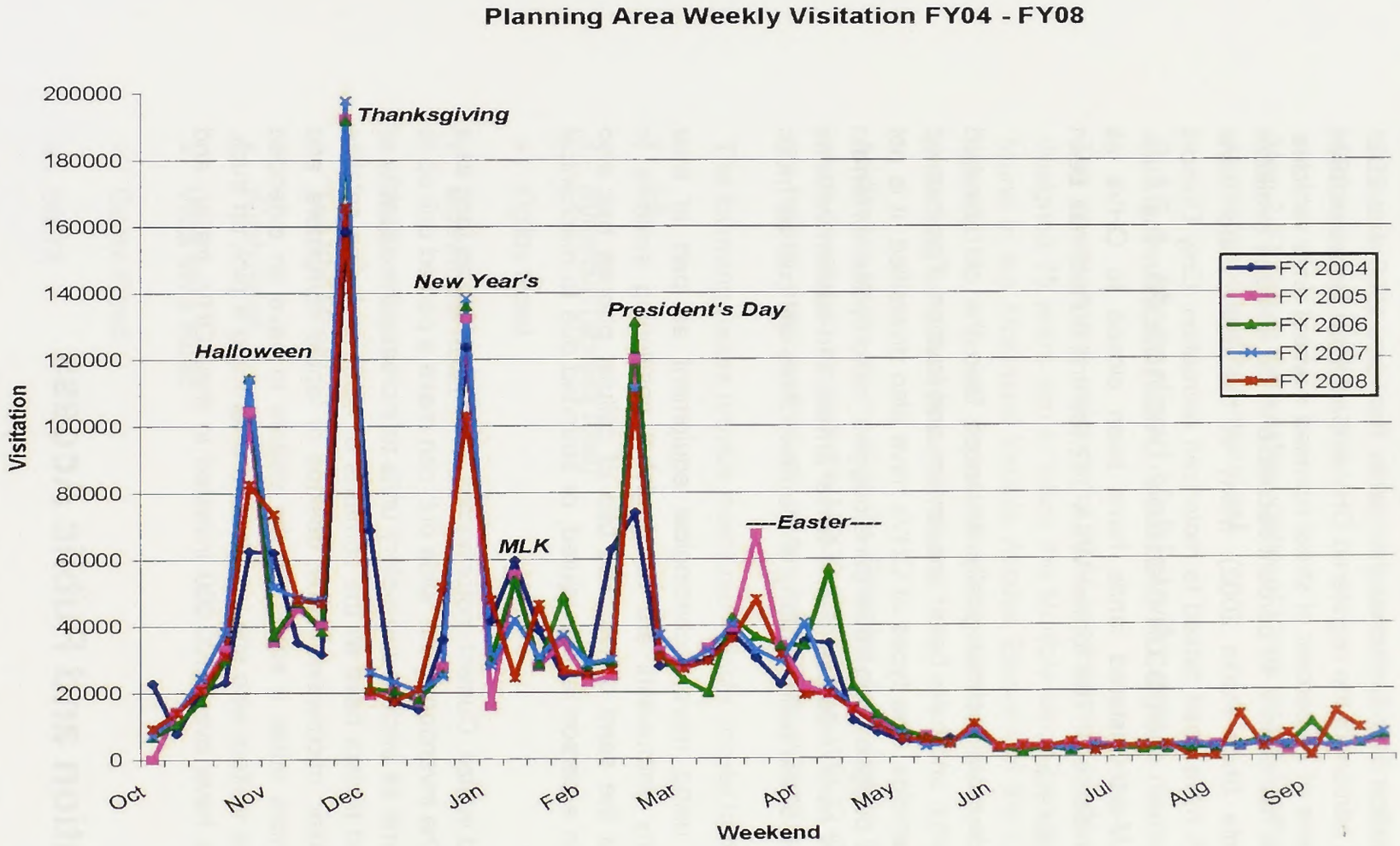


Figure 3.1 This graph illustrates the extreme peaks in visitation. These data were collected through vehicle counters located at Gecko Road, Osborne, Glamis off-ramp, Wash Road, Ogilby camp area, Gordons Well, and Grays Well. The vehicle counts were taken every Monday morning and multiplied by 3.5 to extrapolate the visitor count (BLM 2009b).

3.14.9 Historical Trends

Although it is believed that the fluctuation in the economy can cause yearly fluctuations in visitation, the level of visitation has increased over time. Between 1980 and 2001 there was an increase of 108 percent of the registered OHV in California. Between 1994 and 2001 there was an increase of 74 percent of street licensed 4-wheel drive vehicles. Between 1980 and 2000 there has been a 48 percent decrease in the acreage available for OHV recreation (California State Parks 2002). Many of the other major dune recreation areas in the CDCA have been closed to motorized recreation. Only Dumont Dunes and the ISD SRMA remain open to OHV recreation. Within the Planning Area, 25,843 acres (12%) of BLM-administered lands have been closed to OHVs as congressionally designated wilderness. The former WSA 362 (central dunes) has been released from further wilderness study.

Later model OHVs are much more technologically advanced than the old standard OHVs. OHVs are more powerful, and have better suspension and traction. This has led to faster and more reliable vehicles. The types of OHVs have also diversified. It is not unusual to see standard dune buggies, long travel dune buggies, motorcycles, all terrain vehicles, all terrain cycles, golf carts, side-by-sides, 4-wheel drives, and custom vehicles only limited by the imagination of the builder. Many of the new OHVs will cost as much as $100,000 or more.

OHV enthusiasts are also using more technological equipment as part of their recreational experience. Many enthusiasts are using global positioning systems to navigate through and around the sand dunes. The use of cellular phones has also helped in circumstances when a person is lost, injured, or stranded due to mechanical malfunction.

Camping units have increased in size. Current motor homes and trailers are as long as a semi-truck and much wider. The invention of the "slide out" can make a parked unit up to 15 feet wide. OHV trailers come as enclosed two-story units to increase the capacity of OHVs. New motor homes and trailers have all the comforts of home including satellite dish TV, refrigerator and freezer, microwave ovens, desktop or laptop computers, and telephones. These conveniences make it easier for the visitors to have an extended stay. Although there are many visitors who still "rough it" in a tent and a pick up truck, many of the visitors will also have over $100,000 invested in their OHV, trailer, and camping unit.

3.15 Transportation and Public Access

Access refers to the physical ability and legal right of the public, agency personnel, and authorized users to reach public lands. Access to the public lands within the Planning

Area is an issue of concern to both agency personnel and the public. The existing fragmented ownership pattern of BLM-administered lands intermingled with private, state, and other federal lands complicates the access situation. Generally speaking, access is acquired from willing adjacent landowners on a case-by-case basis and as needs or opportunities arise.

Map 2-27 shows the existing routes of travel for the Planning Area. Routes are identified as motorized and non-motorized.

3.15.1 Motorized Vehicle Access

The transportation network for BLM-administered lands within the Planning Area was designed 25 years ago to follow the Multiple-Use Class guidelines and further guidance found in the Motorized Vehicle Access Element of the CDCA Plan. The network was intended to improve opportunities for recreational use in the Planning Area while protecting sensitive resource values.

Additional routes of travel in the Planning Area (within the one-mile limited use area) were developed through the NECO (2002) and WECO (2003) plans. In addition, there are federal, state, and county routes and ROWs within the Planning Area.

The following routes provide motorized vehicle access to the Planning Area:

- I-8
- Buttercup (access road)
- Ogilby Road
- Sidewinder Road
- Walker Way
- Ted Kipf Road
- Wash Road
- Vista Mine Road
- Gecko Road
- SR-78
- Niland-Glamis Road

The two major road ROWs (SR-78 and I-8) that cross the recreation area in an east-west direction provide primary access to the Planning Area.

3.15.2 Non-motorized Vehicle Access

Motorized vehicle travel is prohibited within the 25,843 acres that comprise the North Algodones Dunes Wilderness. Motorized vehicle access is also prohibited in the 3,412-acre Administrative Closure immediately north of the WA, in the 1,999-acre Administrative Closure in the Gecko area, in the 42,229-acre large, central Administrative Closure and the 311-acre Administrative Closure immediately to the south, and the 147-acre Administrative Closure in the Buttercup area.

3.16 Lands and Realty

BLM manages a diverse combination of land and resources in the Planning Area, including land use for utility corridors, communication sites, land tenure issues, land use authorizations, withdrawals, and renewable energy.

3.16.1 Utility Corridors and Communications

Map 2-28 shows the location of the utility corridor and communications sites.

3.16.1.1 Utility Corridors

A major utility corridor within the recreation area passes through the Buttercup Valley Open Area parallel to I-8. Existing facilities include a 500 kV transmission line and a number of smaller power and telephone lines. Transmission lines also parallel the Coachella Canal and the UPRR. A high-pressure gas pipeline is located within the railroad ROW, and a microwave relay tower is located west of Ogilby.

3.16.1.2 Communication Sites

There are four communication sites within the Planning Area. Osborne Overlook and Cahuilla Ranger Station communication sites are located just south of the North Algodones Dunes Wilderness and SR-78 (see Map 2-28). The communication site at Dunes Vista is located in the southeast portion of the Planning Area at the intersection of Ogilby Road and I-8. The communication site at Dune Buggy Flats is located in the southwestern portion of the Planning Area, just north of I-8 and just west of the Coachella Canal. Two of the communication sites are small BLM-operated sites (Cahuilla Ranger Station and Dune Buggy Flats) that provide communication for BLM staff throughout the Planning Area. Primary users of the Osborne Overlook and Dunes Vista communication sites include other federal government agencies (e.g., USBP and

the military). Commercial entities also use a portion of the sites for cellular usage, and radio and TV signals. Some city and county governments also have facilities to support their communication needs.

3.16.2 Land Tenure

3.16.2.1 Acquisitions

The lands and realty program primarily assists in the acquisition of easements to provide for legal access where other programs have identified a need. Access refers to the physical ability and legal right of the public, agency personnel, and authorized users to reach public lands. BLM will comply with all deed restrictions on all acquisitions.

Land acquisitions are considered on a case-by-case basis through exchange, purchase, donation, or eminent domain. Acquisition of easements, for purposes such as access or conservation, is also considered on a case-by-case basis. Decisions to acquire lands would be based on public benefits, management considerations, and public access needs.

Donated lands within the Planning Area include lands quitclaimed to the US by the State Lands Commission through a land exchange with the BLM, lands purchased with Land and Water Conservation Funds, and lands donated by The Wildlands Conservancy (Map 3-9). These lands were donated to preserve the natural resources within these areas.

Donated lands are not automatically withdrawn from operation of the public lands laws. Any applications for use are evaluated in light of current BLM management, and the proposed use can be subject to environmental review.

3.16.2.1.1 Ongoing Land Acquisition Project

The BLM is actively acquiring flat-tailed horned lizard habitat as mitigation for impacts to habitat resulting from several projects including the Arizona State Highway project, Drop 2 Water Reservoir, All-American Canal lining, among others. Compensation monies are being used to make the purchases of lands from willing sellers. Sections of land, or portions thereof, in various stages of the acquisition process lie within the boundary of the Planning Area.

3.16.2.2 Land Status and Jurisdiction

Land ownership within the Planning Area is composed of federal, state, and private. The public lands within the Planning Area come under the jurisdiction of the ECFO, located in El Centro, California.

Privately-owned lands that occur in the Planning Area include a few agricultural and rural home sites which are intermingled throughout.

3.16.2.3 Public/Private Interface

Generally, the Planning Area does not have a public/private land interface problem. There are situations throughout the area in which public and private lands intermingle and create property boundaries which do not conform to logical natural topographic features. This occasionally complicates management of activities and resources.

3.16.2.4 Land Tenure Adjustment

Land tenure (or land ownership) adjustment refers to those actions that result in the disposal of BLM lands or the acquisition of nonfederal lands or interests. There are currently no BLM-administered lands available for disposal. Acquisitions of non-federal land parcels are considered on a case-by-case basis through exchange, purchase, donation, or eminent domain.

On July 25, 2000, the FLTFA, referred to as the "Baca Bill", became Public Law 106-248. The Baca Bill allows BLM to utilize funds from land sales and exchange equalization payments to acquire lands, if such acquisition is found to be in the public interest. Prior to the Baca Bill, receipts from land sales went primarily to the US Treasury and were not available to BLM. To meet the criteria for disposal under the Baca Bill, public lands must have been identified for disposal through a management plan approved prior to July 25, 2000, when FLTFA became law. FLTFA will expire in 2010 unless amended through legislation.

3.16.3 Land Use Authorizations

Land use authorizations include various authorizations and agreements to use BLM-administered land, such as ROW grants, leases, and temporary use permits under several different authorities (Appendix L). BLM analyzes requests for land use authorizations on a case by case basis.

3.16.3.1 Land Use Permits

BLM administers several temporary permits involving less than 3 acres of land. These permits are issued for a term of up to three years and are for the temporary use of public lands. Film permits are short-term uses and the actual number of permits issued varies monthly. At present, 14 permits have been issued for filming in the Planning Area (2009). There are five (3-year) apiary permits in the Planning Area, which include a total of 35 sites on 8 acres. These permits allow for the annual servicing of bee hives at several sites scattered throughout the Planning Area and can be renewed.

3.16.3.2 Rights-of-way

Existing grants are for a myriad of different facilities and are held by private individuals and groups, as well as by various business and government entities (Appendix M). Roads, power transmission and distribution lines, and telephone lines are the most common facilities to be granted for ROWs. Examples of additional types of ROW facilities include water and gas pipelines, communication sites, ditches, railroads, and fiber optic lines.

In addition to a limited number of parcels in private ownership as well as lands withdrawn for other federal use (such as that by the DOD or the BOR) under FLPMA, the BLM has granted a number of ROWs for facilities within the Planning Area.

As with other BLM-administered lands, ROWs and temporary use permits within the Planning Area are normally granted subject to other valid, pre-existing rights including the right of entry unless specifically prohibited. Rights-of-way, temporary use permits, and other similar entitlements are normally not granted if the use for which the ROW is intended would conflict with a valid pre-existing use. Thus, OHV recreational activities still occur on utility ROWs within the Planning Area. Entry into lands that have been withdrawn or reserved, on the other hand, is normally precluded for purposes other than those intended for the withdrawal or reservation. Hence, public entry is prohibited in military areas.

Interstate 8 is the major east-west highway and traverses the Planning Area from the southeast and proceeds to the west for about 10.3 miles through the southern portion of the Planning Area. The UPRR runs 40.7 miles along the western portion of the Planning Area.

As previously described, there are major utility ROW corridors presently traversing the Planning Area. The I-8 corridor runs east/west across approximately 10.3 miles of public land near Interstate 8. Another major ROW corridor runs parallel to the I-8 corridor and currently contains one 500 kV transmission line that originates in San Diego and crosses the Colorado River into Arizona, and there are several buried fiber optic networks and telephone lines.

A 39-mile utility corridor and UPRR ROW runs along the eastern boundary of the ISD SRMA. This contingency utility corridor is 2 miles wide and can be brought forward into the CDCA Plan after simultaneous plan amendment and EIS on an identified project.

Revised Statute 2477 (RS 2477)

In 1976, Revised Statute (RS) 2477 was repealed by the FLPMA, 43 USC § 1701 et seq. Pub. L. No. 94-579 § 706(a), 90 Stat. 2743. FLPMA did not, however, terminate valid rights of way that had been established under RS 2477 prior to its repeal. Instead,

Congress specified that any valid RS 2477 ROWs existing as of the date FLPMA was approved (October 21, 1976), would continue in effect.

The most recent Departmental guidance on RS 2477 was issued on March 22, 2006. The guidance document was issued after the 10th Circuit Court of Appeals issued a decision in Southern Utah Wilderness Alliance *v.* Bureau of Land Management, 425 F. 3d 735 (10th Cir. 2005). The Department revoked the previous policy guidance from January 22, 1997 and December 7, 1988.

RS 2477 is a complex and controversial issue with far-reaching implications for the management of federal lands throughout the West. RS 2477 was enacted in 1866, during a period when the federal government promoted settlement of the West. It was a primary authority under which many state and county highways were constructed over federal lands in the West. By its general wording, "the right-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted" the act minimized the administrative burden on the federal government to authorize the construction of each highway across the largely undeveloped lands in the West. While the act accomplished its goal of facilitating development, the general wording and a lack of documentation of RS 2477 rights continue to be sources of disagreement and controversy.

Although FLPMA repealed RS 2477, it did not terminate existing RS 2477 ROWs. Section 701 of FLPMA states that nothing "shall be construed as terminating any valid lease, permit, patent, right-of-way, or other land use authorization existing on the date of approval of this Act."

Some paved roads, which serve as major transportation routes, have no ROW documented in public land records. Many routes, claimed as RS 2477 ROW, came into existence with no documentation in public land records. National parks, national monuments, national preserves, national forests, national wildlife refuges, national conservation areas, other special areas (e.g., designated WAs), and military bases were reserved after 1866. Generally, these areas were reserved subject to valid existing rights (rights established before the reservation). Some public lands were conveyed out of federal ownership after 1866, also subject to valid existing rights. Under RS 2477, routes which came into existence after 1866 may be existing rights, but they must have been established: (1) before reservation for a public purpose, withdrawal, patent, mining claim, or transfer out of federal ownership; and (2) before the passage of FLPMA (October 21, 1976). Holders of existing rights retain a right of access associated with those rights without an RS 2477 ROW. However, BLM approval is required prior to driving on any closed route.

BLM decisions about which routes are designated open or limited and which are designated closed are based on resource management concerns and legal mandates (such as in designated wilderness) in a process called "route designation." Routes will

be designated during this planning process as implementation actions, in conformance with the plan decisions which designate areas open, closed or limited.

A route designated "open" does not mean that BLM believes the route to be an RS 2477 ROW. Conversely, a route designated as closed does not reflect a belief that an RS 2477 ROW does not exist. The closure of a route does not modify or extinguish any RS 2477 ROW that may exist. Holders of other valid ROWs or other valid existing rights, retain a right of access without an RS 2477 ROW. However, BLM approval is required before driving on any closed route. Closed routes outside WAs will remain closed until RS 2477 assertions are processed or until the routes are opened using the route designation process.

3.16.3.3 Realty Trespass

Realty trespass—specifically unauthorized occupancy, use, and development—is not a significant problem in the Planning Area. Unauthorized occupancies are typically encroachments of buildings or yards onto public land and have usually existed for many years. These situations are most often discovered in the course of surveying projects. Unauthorized ROW situations generally involve negligence. Resolution of such situations depend upon individual circumstances and may include issuance of temporary land use permits, leases or ROWs, disposal of the land either by sale or exchange, or removal of the unauthorized use.

3.16.4 Withdrawals

The existing withdrawals in the Planning Area are described below and illustrated on Map 3-10.

The BOR retains a withdrawal on the ROWs of the new Coachella Canal and All-American Canal (1,000 feet on either side of the canal centerline). The BOR must approve BLM management programs initiated within the canal ROWs. The paramount use on all BOR-withdrawn lands are BOR programs.

The 1994 CDPA designated the North Algodones Dunes Wilderness within the Planning Area, withdrawing it from all forms of land entry.

3.16.5 Renewable Energy

As demand has increased for clean and viable energy to power the nation, consideration of renewable energy sources available on public lands has come to the forefront of land management planning. Renewable energy includes solar power, wind, biomass, and geothermal resources. Only solar and wind energy potential will be discussed below. See Section 3.13.3 (Minerals) for further discussion of geothermal resources.

In cooperation with the National Renewable Energy Laboratory (NREL), an agency of the Department of Energy (DOE) has developed a Renewable Resource Assessment Project. The findings of this project are contained in a 2003 report entitled, *Assessing the Potential for Renewable Energy on Public Lands*. The report identified criteria that are considered in establishing potentials for various types of renewable energy. It also identifies the top 25 BLM Planning Units with the largest total land area of high-potential concentrating solar power sites with solar resources of 6 kWh/m^2/day or greater. The Planning Area was included among this top 25 (Map 3-11).

To date, there are no solar energy sites and there have been numerous inquiries regarding the development of solar energy on BLM-administered lands within the Planning Area. Solar potential is likely discounted due to lack of large open flat spaces, topography, and/or excluded areas due to critical habitat, and VRM classes. Demand for renewable energy development is expected to increase over the planning period, and management actions are necessary to provide for future renewable energy growth while protecting sensitive resource values.

Renewable energy potential on public lands was researched and presented in Assessing the Potential for Renewable Energy on Public Lands by BLM and US Department of Energy, Energy Efficiency and Renewable Energy (2003). This assessment analyzed the potential for wind energy (and other renewable energy) development on public lands in the western US. The most important screening criteria used in developing the model for wind energy potential consisted of the following:

- Wind resource is wind power class 4 and above for short term, class 3 and above for long term.
- Federal, state, and local policies support wind energy.
- Transmission access is within 25 miles (69–345 kV) and transmission capacity is available.
- Site must be compatible with wind energy development; scenic areas, view-sheds, and non-development regions must be eliminated.
- Site must have access to roads within 50 miles.

A few additional items were also reviewed but not given the same weight as the above criteria. Based on this analysis, there is little potential to support wind energy on BLM-administered lands in the Planning Area (Map 3-12). No areas within the Planning Area have been identified by NREL as having a moderate to high potential for wind resources.

3.17 Public Health and Safety

3.17.1 Hazardous Materials and Public Health

This section evaluates the storage and use of hazardous materials and the disposal of non-hazardous and hazardous waste within the Planning Area. In addition, the results from a search of applicable federal and State of California environmental databases are provided to give a better understanding of the hazardous materials used and disposed of near the Planning Area. Existing effects to human health and the environment are discussed to provide a baseline from which the proposed project alternatives can be analyzed.

3.17.1.1 Current and Past Uses of Adjoining Property

Land uses proximate or adjacent to the Planning Area include a number of non-recreation applications. These land uses include BOR-withdrawn lands, military target areas, sand and gravel sales activities, geothermal leases, mining, and utility transportation ROWs. Although certain of these land uses have an undetermined potential for minor hazardous material releases or localized contamination, they are not of the type that typically would be expected to pose a substantial hazardous material-related threat to the surrounding environment.

3.17.1.2 Hazardous Materials Management

Hazardous materials within the Planning Area consist of materials within municipal and informal dumping sites, and mining-related hazardous materials. Each is described in more detail below.

3.17.1.2.1 Landfills

Operating, closed, and informal landfills have the potential to cause environmental impacts to BLM-administered land. Chemical leachate from landfills has the potential to contaminate soil and reach surface water or groundwater. Local law enforcement is responsible for enforcing laws and regulations that prohibit illegal dumping in landfills found on lands that are not managed by BLM. The only known landfill near BLM-administered lands within the Planning Area is the Mesquite Regional Landfill. The Mesquite Regional Landfill is permitted to receive waste by rail nonhazardous (class III) municipal solid waste from southern California counties. The site is also permitted to receive up to 1,000 tons per day by truck from Imperial County. The landfill is located on 4,250 acres next to the Mesquite Gold Mine, 5 miles northeast of Glamis on SR-78 near the UPRR.

3.17.1.2.2 Mining and Milling Waste

Hazardous mining waste consists of mineralized waste rock, ore stockpiles, and mill tailings. Metallic minerals that occur in the rock have the potential to contaminate soil and water down gradient of the mining waste. Mill tailings may contain traces of metals as well as other chemical constituents, such as acids. Further, mine workings and mine dumps containing sulfide mineralization can create acid mine drainage when exposed to oxygen and water. The potential for this type of hazardous material occurs at abandoned mines on and adjacent to BLM-administered land. Abandoned mines and associated features and structures, if 50 years old or older, are considered potential historic resources and are subject to provisions of the NHPA and other heritage preservation mandates. There are no known abandoned mines in the Planning Area.

3.17.1.3 Environmental Database Results

A review of available environmental records was performed to determine and identify known hazards associated in the Planning Area and adjacent properties. An electronic database report was obtained from Fidelity Information Services, prepared in accordance with the American Society for Testing and Materials practices, which include all reasonably ascertainable environmental records including state and federal sources. Appendix N contains a brief summary of each database searched that resulted in known sites within or near the Planning Area. No sites of environmental significance were identified.

3.17.1.4 Unexploded Ordnance

Although there are no known occurrences within the Planning Area, which is a formerly used defense site, there is a low potential for UXOs on public lands to be present as a result of ongoing military maneuvers. Given the amount of aircraft used on the various military facilities in the Planning Area, there is a low possibility that a military aircraft could crash and be a source of UXO.

3.17.2 Noise

3.17.2.1 Fundamentals of Noise

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to measure noise, depending on the source of the noise, the receiver, and the reason for the noise measurement. Environmental noise levels are typically stated in terms of decibels on the A-weighted scale (dBA). Noise levels stated in terms of dBA reflect the response of the human ear by filtering out some of the noise in the low- and high-frequency ranges that the ear does not detect well. The A-weighted scale is used in most community

ordinances and standards. Human hearing typically encompasses the sound range from just above 0 dBA at the quietest end to approximately 140 dBA, where pain is produced in most listeners and permanent hearing loss would result.

3.17.2.2 Existing Noise Environment

The Planning Area is in a relatively remote desert region of the southeastern portion of the state. The Chocolate Mountains and Cargo Muchacho Mountains are located to the north and east of the Planning Area. The town of Brawley is located to the west, and Mexico is located to the south. Recreational activities that occur within the Planning Area include OHV recreation, camping, hiking, and flora/fauna observation.

Natural deserts do not exceed 66 decibels, and no desert animal creates sounds above 56 decibels. Mechanized sounds increase the decibel level in the desert. A motorcycle's sound ranges from 40 to 100 decibels. Within 100 meters, the peak decibels created by a motorcycle exceed those of naturally occurring sounds.

Ambient noise level measurements for the Planning Area are not available. Ambient noise levels in the Planning Area and vicinity generally are assumed low and typical of remote desert areas (i.e., 35 to 50 dBA), except as may be modified by noise-generating activities in the Planning Area and vicinity, including:

- Noise from train movements on the UPRR tracks located along the east side of the Planning Area
- Noise associated with occasional recreational and support activities, especially both concentrated and dispersed OHV recreation within the Planning Area and the immediate vicinity
- Vehicular traffic noise on major roadways leading to the Planning Area
- Intermittent military aircraft maneuvers and military weapons explosions associated with the use of the Chocolate Mountain Aerial Gunnery Range located to the northwest of the Planning Area and a gunnery range north of East Mesa
- Occasional military aircraft overflights associated with flight corridors located above and adjacent to the Planning Area
- Military helicopter use of the Planning Area as a training ground for the use of night vision devices
- USBP helicopter use of the Planning Area as a part of apprehending undocumented immigrants and smugglers
- Private air ambulance service as a part of providing medical aid to visitors

- Mineral exploration, including drilling by Glamis Imperial under existing BLM approvals
- Natural sources such as wind, rain, thunder, and wildlife

3.17.2.2.1 OHV Noise Levels

The primary noise sources in the Planning Area are OHV activities and vehicular traffic on local roads. The noise levels from OHV recreation are variable, with older vehicles producing higher noise levels than newer ones. California Vehicle Code Section 38370 requires that decibel levels (measured at 50 feet) for Green Sticker vehicles be below (a) 92 dBA for any such vehicle manufactured before January 1, 1973; (b) 88 dBA for any such vehicle manufactured on or after January 1, 1973, and before January 1, 1975; (c) 86 dBA for any such vehicle manufactured on or after January 1, 1975, and before January 1, 1986; and (d) 82 dBA for any such vehicle manufactured on or after January 1, 1986. According to data from *Dirt Wheels* Magazine, and tests from Oregon Dunes National Recreation Area, even with mufflers, noise levels from OHVs are found to be in the range of 81 to 111 dBA per unit at a distance of 20 inches (Scharf 1999). A noise level of 111 dBA at 20 inches is estimated to attenuate to a level of approximately 85 dBA at a distance of 50 feet.

The level of OHV activities in or near the Planning Area varies throughout the year, with little, if any, OHV recreation and noise during the summer months. Virtually all OHV recreation in the Planning Area occurs from mid-October to May, with approximately 50 percent of total annual OHV recreation occurring on the following six holidays/weekends: Halloween, Thanksgiving, New Year's, Martin Luther King Day, Presidents' Day, and Easter. During these high-use weekends, OHV-related noise levels can be relatively high within certain areas of the Planning Area. The remaining 50 percent of annual OHV recreation occurs primarily on other weekends throughout the October-May period. Therefore, background OHV noise levels in and around the Planning Area range from low (during weekdays) to moderate during moderate-use weekends, and high during the six high-use weekends.

3.17.2.3 Sensitive Receptors

Sensitive noise receptors are, in general, those areas of human habitation or substantial use where the intrusion of noise has the potential to adversely impact the occupancy, use, or enjoyment of the environment. These can include residences, schools, hospitals, parks, and places of business requiring low levels of noise. Since the Planning Area is situated in a very remote area, there are no such typical sensitive human receptors in or anywhere near the Planning Area. The Cahuilla Ranger Station is located within the Planning Area, but is considered part of the administration of the Planning Area and therefore not a sensitive receptor.

The closest area of likely sensitive receptors would be an unincorporated area of Imperial County located just west of East Mesa and the East Highline Canal (approximately 7 miles west of the Planning Area). The town of Brawley is located farther west, approximately 25 miles to the west of the Planning Area.

3.17.3 Law Enforcement and Public Safety

The US Congress recognized that law enforcement on BLM-managed public lands was needed to encourage public safety and to protect resources. In 1976, BLM was given law enforcement authority with the passage of FLPMA. As such, BLM law enforcement officers are responsible for promoting public safety and protecting resources within the 264 million acres of BLM-managed public land in the US. These law enforcement goals are accomplished in partnership with other federal, state, and local law enforcement agencies. ECFO law enforcement officers patrol the Planning Area and are tasked with a variety of services, including: educating the public on the rules and regulations, providing security at recreation sites, preventing theft of and damage to biological and cultural resources, assisting in emergency response situations, enforcing the rules and regulations through issuing warnings and citations, and making arrests. These officers enforce both state and federal regulations in the Planning Area.

3.17.3.1 Recorded Incidents

3.17.3.1.1 Emergency Response - Medical Aid and Fatalities

During the 2007-2008 visitor season, approximately 609 incidents requiring medical aid occurred over the six major holiday weekends. Based on an average of 92,376 visits per major holiday weekend (attendance can swell to over 100,000 visits during Thanksgiving weekend), this represents an average of 101.5 medical aid incidents per major holiday weekend. The number of fatalities averaged approximately two per busy holiday weekend during the 2007-2008 visitor season. Table 3-18 lists a summary of documented medical aid responses and fatalities (2004 to 2008) provided by the ECFO.

TABLE 3-18
DOCUMENTED MEDICAL AID RESPONSES AND FATALITIES WITHIN THE PLANNING AREA, FY2004–FY2008

Fiscal Year	Medical Aid Responses	Fatalities
FY2004	676	6
FY2005	687	9
FY2006	756	13
FY2007	737	14
FY2008	609	13

(BLM Unpublished data, 2009)

3.17.3.1.2 Citations and Arrests

During the 2007-2008 visitor season, 4,673 citations/arrests occurred over four of the six major holiday weekends. On average, this represents approximately 779 citations and/or arrests per major holiday weekend (BLM unpublished data, 2009). Law enforcement incidents occur throughout the Planning Area, but are generally concentrated around campgrounds and meeting places, as well as access points.

Violation notices tracked by BLM El Centro include the following categories: registration, minor in possession, no helmet, double riding, no lights, resisting arrest, open container, no safety flag, closed area, vendor permit, controlled substance, use fee, ride in pickup bed, natural feature destruction, speeding, possession of marijuana, furnishing alcohol to minor, revoked license, dumping, glass container, creating a hazard, litter, and concealed (loaded) firearm. Arrests tracked by BLM El Centro include the following categories: driving under the influence, assault, felony evade, warrant, drugs, explosive device, inciting riot, false information, auto theft, possession of stolen property, and interference. Table 3-19 provides a summary of violation notices (citations) that BLM El Centro issued during fiscal years 2004-2008, while Table 3-20 provides a summary of arrests that BLM El Centro issued during fiscal years 2004-2008.

TABLE 3-19
TOTAL CITATIONS WITHIN THE PLANNING AREA, FY2004–FY2008

Fiscal Year	Number of Citations[1]
FY2004	2,170
FY2005	2,308
FY2006	1,447
FY2007	2,725
FY2008	4,555

[1] Records do not include Martin Luther King Jr. or Easter holiday weekends.
Source: BLM Unpublished data, 2009

TABLE 3-20
TOTAL ARRESTS WITHIN THE PLANNING AREA, FY2004–FY2008

Fiscal Year	Number of Arrests[1]
FY2004	102
FY2005	75
FY2006	111
FY2007	51
FY2008	118

[1] Records do not include Martin Luther King Jr. or Easter holiday weekends.
Source: BLM Unpublished data, 2009

3.17.3.2 Law Enforcement Personnel

The El Centro Field Office has a staff of 12 delegated law enforcement officers (one Chief, two Supervisors, and nine Rangers) who conduct regular patrols of the Planning Area. Various vehicles (e.g., quadrunners and dune buggies) are used to patrol the interior of the dunes to monitor OHV use. Most visitors stay within 1 mile of paved roads and the Sand Highway; however, with the increased use of global positioning system units, visitors are starting to venture further into the inner dunes (BLM 2001d).

Additional staffing resources include BLM staff from other offices, as well as other federal and state agencies including National Park Service, USFWS, USBP, US Forest Service, State Parks, California Highway Patrol, Imperial County Sheriff's Department, Imperial City Police Department, Brawley Police Department, El Centro Police Department, Calipatria Police Department, and Calexico Police Department. These additional resources are typically brought in over four of the six major holiday weekends (Table 3-21). Some additional staffing resources are delegated law enforcement officers; others do not have the authority to arrest, but are capable of detaining individuals until delegated law enforcement officers can arrive. The Imperial County Sheriff's Department and BLM currently co-lead law enforcement activities for major holiday weekends. The Imperial County Sheriff's Department provides an average of 20 officers on holiday weekends and several deputies on non-holiday weekends.

TABLE 3-21
BLM RANGERS AND ADDITIONAL LAW ENFORCEMENT OFFICERS BY MAJOR HOLIDAY WEEKEND, FY 2004–FY2008

Major Holiday Weekend[1]	FY2004	FY2005	FY2006	FY2007	FY2008
Halloween	38	n.d.	78	48	45
Thanksgiving	35	31	58	46	62
New Year's Eve/Day	43	41	42	n.d.	66
Presidents' Day	67	55	60	54	n.d.
Total	183	127	238	148	173

[1] Records do not include Martin Luther King or Easter holiday weekends.
n.d. = no data
Source: BLM Unpublished data, 2009

El Centro law enforcement personnel determine the number of officers needed for each holiday weekend to provide services for the Planning Area based on the estimated visitor supply. They then coordinate with other agencies to arrange for the officers.

3.17.3.3 Public Safety Facilities and Equipment

The ECFO has two permanent ranger stations within the Planning Area. Cahuilla Ranger Station is located on Gecko Road, within the most heavily visited area. Buttercup Ranger Station is located immediately south of I-8 in the Buttercup area. Both Ranger Stations are open approximately 14 hours each day during holiday periods (approximately 20 days per year). On non-holiday weekends, the ranger stations are open approximately eight hours per day.

Additionally, during holiday weekends, one temporary contact station is set up in the Dune Buggy Flats area. Law enforcement shares facilities with the park rangers; there is no specific area reserved only for law enforcement use.

The closest hospital to the North Dunes area is Pioneer Memorial, located in Brawley, California, approximately 20 miles from the Planning Area. The closest hospitals to the South Dunes area are Yuma Regional in Yuma, Arizona, located approximately 25 miles from the Planning Area and El Centro Regional Medical Center in El Centro, California, located approximately 40 miles from the Planning Area.

3.17.3.4 Border Issues

The Planning Area has extensive undocumented immigration and other US-Mexico border health and safety issues with Mexico, including transient populations and illegal dumping activities. USBP is called upon to rescue numerous undocumented immigrants who attempt to cross rugged, desert terrain without being properly prepared. Numerous deaths have occurred, although most of them are in the desert east of the Planning Area. Occasionally, undocumented immigrants and/or those transporting them drive in a very reckless way endangering other motorists and pedestrians. Illegal drugs are also smuggled over the US-Mexico border and some of this takes place in the Planning Area as well. While there is a public perception that the border area is somewhat unsafe, USBP has put great effort into making border areas safer through the construction of the border fence, installation of cameras that monitor the border area, and increased agent patrols. In conjunction with resource issues, these public health and safety issues create challenging management decisions for the BLM and cooperating agencies.

An International Boundary Reservation established by the Presidential Proclamation of May 27, 1907, restricts use within sixty feet of the international boundary between the United States of America and the United Mexican States, within the State of California and the Territories of Arizona and New Mexico. The Proclamation reserves all public lands within this 60-feet wide strip, from entry, settlement or other form of appropriation under the public land laws. This area is to be kept free from obstruction as a protection against smuggling between the US and Mexico. This reservation affects approximately 11.5 miles of BLM-administered public lands within the Planning Area, roughly 83 acres.

3.18 Social and Economic Setting

The BLM-administered lands in the Planning Area are distributed across the eastern portion of Imperial County, California. This section focuses on the demographics and social trends of Imperial County and nine other counties within Arizona and California surrounding or in the vicinity of the Planning Area. In addition, the following individuals and groups will be discussed: OHV recreational users, environmental advocacy groups, vendors, OHV-related business owners, and local communities.

The economic analysis for the Planning Area is divided in two geographic areas. The Economic Impact Area (EIA) is defined as the three counties of Imperial, Yuma, and La Paz in which 90 percent or more of the spending impacts of the Planning Area visitors would be felt: The Market Demand Area (MDA) is defined as the 10 counties that generate more than 90 percent of all visitors to the Planning Area. The 10-county MDA includes the three EIA counties of (1) Imperial, (2) Yuma, and (3) La Paz plus: (4) Los Angeles, (5) San Bernardino, (6) Riverside, (7) Orange, (8) San Diego, (9) Maricopa, (10) and Pima.

3.18.1 Social/Cultural/Economic History

The ISD has played a significant role in shaping the human history of the Colorado Desert. Located west of the Lower Colorado River, the sand dunes are a unique landscape in southern California and northeast Baja California. The sand dunes are within or near the traditional lands of the Cahuilla, Chemehuevi, Cocopah, Kamia, Kumeyaay, Mohave, and Quechan. Only the Quechan and Kamia visited the area with any regularity, since the sand dunes formed the boundary between these tribes. No tribes had settlements within the Planning Area (Russell et al. 2002; Underwood and Cleland 2002).

The sand dunes figured in the spirit life and origin accounts of the Mojave, Kamia, and Quechan and are considered spiritually significant (Russell et al. 2002). The Native American tribes in the region also had important travel corridors through the Planning Area in prehistoric times, and these general routes are now followed by I-8 and SR-78. The Planning Area may contain spiritually and politically significant human remains (Russell et al. 2002), but none have been discovered or documented (Underwood and Cleland 2002) to date.

Prehistorically, the dunes provided a variety of resources, such as plants and small game for food and plants for medicinal purposes, basketry, and other crafts. These resources were also available in more accessible places near habitations, and the archaeological record suggests that the sand dunes were not visited a great deal (Underwood and Cleland 2002)

In early historic times, the sand dunes were viewed as a significant travel barrier. Spanish explorers, such as Anza and Garcés, avoided the ISD by passing south along the Alamo River. Similarly, American forty-niners and other pioneers moving west along the southern emigrant trail went south of the ISD. Thus, the trail dropped south of the US-Mexico border to avoid the sand dunes. The ISD were also a problem for the Southern Pacific Railroad line being built from Los Angeles to Yuma in 1877. The railroad avoided the sand dunes by laying tracks east through Mammoth Wash, north of the sand dunes. In the twentieth century, the ISD continued to be an impediment to travel. The eminent auto enthusiast Colonel Ed Fletcher built a one-lane, two-track plank road in 1915 to link San Diego with Yuma. Because of design and maintenance problems, a heavier, fully planked, one-lane version was built in 1916. Despite maintenance problems, that version of the Plank Road remained in service until 1926, when it was replaced by a two-lane asphalt road. The Plank Road was determined NRHP-eligible in 1986 and nominated for inclusion in 2001. It was designated by the BLM as an ACEC in 1985. The Plank Road followed an Indian trail through Buttercup Pass and today the same general route is taken by I-8.

Dr. Oliver Wozencraft, a prominent forty-niner, first conceived the idea of developing the Salton Sink by bringing in water from the Colorado River in 1856. He worked for the next 40 years on the project, but was unsuccessful. In 1896, Charles Rockwood, Anthony H. Heber, and several others formed the California Development Company. Like Wozencraft, Rockwood worked tirelessly to interest the US Congress and financiers in his plans for the creation of a canal to bring Colorado River water to the area now called the Imperial Valley. The company was about to be dissolved in defeat in 1899, when George Chaffee joined the project. Chaffee was founder of the southern California town of Ontario and a world-renowned canal builder with great success in Australia. He was able to attract sufficient support, and by 1900, crews were in the field building a canal from Pilot Knob south around the ISD (Nadeau 1997). In 1901, the Imperial Canal was completed and Imperial Valley gradually became a center of agricultural production. In 1905, the flooding Colorado River broke through the headgate of the canal and soon the entire flow of the river was coursing down the canal. The lower part of Imperial Valley became inundated and eventually was called the Salton Sea. It was not until 1907 that the river was contained; largely through the efforts of the Southern Pacific Railroad (Nadeau 1997).

This and other floods along the Colorado River increased the support for damming the river and creating a safer canal. Beginning in 1918, studies were funded for what became known as the All-American Canal. Construction began in 1934 and was completed in 1940. The canal began approximately 14 miles northeast of Yuma and went through the ISD at Buttercup Pass (Nadeau 1997). The All-American Canal has been determined to be eligible for inclusion to the NRHP.

By the 1920s, the entertainment industry discovered the unique scenery of the sand dunes, which became the backdrop for major Hollywood movies such as *Beau Geste* (1926 and 1939) and the Bob Hope and Bing Crosby classic movie, *Road to Zanzibar* (1941). The sand dunes are a beautiful photographic subject and they continue to be occasionally used for film, television commercials, and both commercial and artistic still photography.

During World War II, Generals George S. Patton, Jr., and Walton Walker were instrumental in developing a facility to train US troops for the North African Theater of Operations. The Desert Training Center/California-Arizona Maneuver Area (1942–1944) spanned from Searchlight, Nevada, south through eastern California and western Arizona to the US-Mexico border. Camp Pilot Knob was located north of Pilot Knob and about 3 miles northeast of the ISD. The camp lies on both sides of I-8, but most of it is north of I-8 (Pigniolo et al. 1997). From Camp Pilot Knob, armor and infantry conducted exercises in the ISD (Pigniolo et al. 1997; Underwood and Cleland 2002).

The primary use of the ISD today is for recreation. This usage also has historical roots, beginning with families from the Yuma area and Imperial Valley who traveled to the sand dunes to drive Plank Road and have a Sunday picnic. By the 1930s, hot rods were being developed and raced informally in the dry lakes of the Mojave Desert. At the same time, the first dune buggies were being tried out at the ISD. Ubiquitous and cheap, Model T and Model A Fords typically served as the basic chassis for both types of highly modified vehicles. After World War II, the ISD became increasingly popular as a place for families to camp and develop machines for driving in the sand. By the mid-1960s, Volkswagen Beetle-based dune buggies were being produced commercially. Numerous small shops and manufacturing facilities now produce sand rails and dune buggies with a wide variety of engine and chassis configurations.

Today, the Planning Area is a major recreational destination during the winter months. On any winter weekend, nearly 100,000 people visit the dunes to camp and drive or ride an ever-widening array of dune vehicles.

3.18.2 Demographic and Socioeconomic Characteristics

As described above, the Planning Area MDA includes the 10 counties of La Paz, Maricopa, Pima, and Yuma in Arizona, and Imperial, Los Angeles, Orange, Riverside, San Bernardino, and San Diego in California. This section describes the demographic and socioeconomic characteristics of the residents of the 10-county Planning Area MDA. The 10 counties of the Planning Area MDA make up a large land area encompassing 44.3 million acres.

Much of the demographic data presented in this report were derived from the 2006 American Community Survey, produced by the US Census Bureau (2006). All 10

counties listed above were used for determining the demographic profiles. Current 2006 demographic estimates and projections for 2030 were also reported for selected characteristics (i.e., population, housing units, and employment) based on data collected from the Southern California Association of Governments, the California Employment Development Department, the Arizona Department of Economic Security, and the US Census Bureau. The decision to use 2006 demographic and socioeconomic data was also based on the desire for consistency with the industry sales and employment data used for the regional input-output models. Table 3-22 lists selected demographic data for the 10-county Planning Area MDA, the Planning Area EIA consisting of Imperial, La Paz, and Yuma counties, and to provide perspective, the data are also listed for California, Arizona, and the US.

3.18.2.1 Population

There were 25 million residents of the MDA in 2006, representing about eight percent of the 299.4 million residents in the US (Figure 3-2). Overall, the 2006 population of Los Angeles County with about 9.5 million residents represented about two-fifths of the population of the MDA. However, the counties of Riverside and San Bernardino, with about two million residents each, have experienced rapid population growth since the 2000 US Census. The population of Riverside jumped 31 percent, and San Bernardino grew 17 percent, compared to about 10 percent growth in population for the MDA over the 2000–2006 6-year period.

3.18.2.2 Population Forecast

The population of the Planning Area MDA is expected to grow to 10.8 million by 2030, a 43 percent increase. By 2030, the population of California would be expected to grow to 49 million (+35 percent) and the population of Arizona would grow to more than 10 million (+68 percent), while the US population would grow at a slower rate to almost 364 million (+21 percent). Within the MDA, the expected growth rates for Imperial (+146 percent), Riverside (+75 percent), and San Bernardino (+71 percent) counties are higher than the expected rate of growth for California or Arizona. In contrast, it is expected that Orange, Los Angeles, and San Diego counties will experience less population growth, adding 25 percent to 31 percent by the year 2030.

3.18.2.3 Gender and Age

The male-to-female gender ratio for the Planning Area MDA is close to fifty-fifty. This near fifty-fifty ratio is very similar for California, Arizona, the US, and across the individual counties. The median age of residents of the MDA in 2006 was 33.7 years, younger than the median age of the US population at 36.4 years. Within the MDA, the residents of Imperial and San Bernardino counties are significantly younger, with a

TABLE 3-22
DEMOGRAPHIC PROFILE OF THE PLANNING AREA MARKET AREA V. CALIFORNIA, ARIZONA, AND THE US

Characteristic	Planning Area EIA[1]	Planning Area MDA[2]	California	Arizona	US
Total Population					
2000 US Census	322,102	22,672,278	33,871,648	5,130,632	281,421,906
2006[3]	367,902	25,000,105	36,457,549	6,166,318	299,398,485
2030 Pop (SCAG, SANDAG, Census)	738,240	35,841,308	49,240,891	10,347,543	363,584,000
Population percent change (2000-2006)	14.2%	10.3%	7.6%	20.2%	6.4%
Population percent change (2006-2030)	100.7%	43.4%	35.1%	67.8%	21.4%
Gender[3]					
Male	50.4%	49.9%	50.0%	50.0%	49.2%
Female	49.6%	50.1%	50.0%	50.0%	50.8%
Age Distribution[3]	100.0%	100.0%	100.0%	100.0%	100.0%
Under 18 years	28.6%	26.9%	26.1%	29.1%	24.6%
18 to 24	11.1%	10.3%	10.4%	6.8%	9.9%
25 to 34	12.7%	14.7%	14.4%	14.6%	13.3%
35 to 45	12.8%	15.1%	15.2%	13.9%	14.7%
45 to 54	11.3%	13.3%	13.8%	12.8%	14.5%
55 to 64	8.4%	9.0%	9.4%	10.0%	10.6%
65 years or older	15.1%	10.7%	10.8%	12.8%	12.4%
Median Age in Years[3]	33.4	33.7	34.4	34.6	36.4
Median Household Income[3]	$36,711	$54,477	$56,645	$47,265	$48,451

TABLE 3-22
DEMOGRAPHIC PROFILE OF THE PLANNING AREA MARKET AREA V. CALIFORNIA, ARIZONA, AND THE US (CONT.)

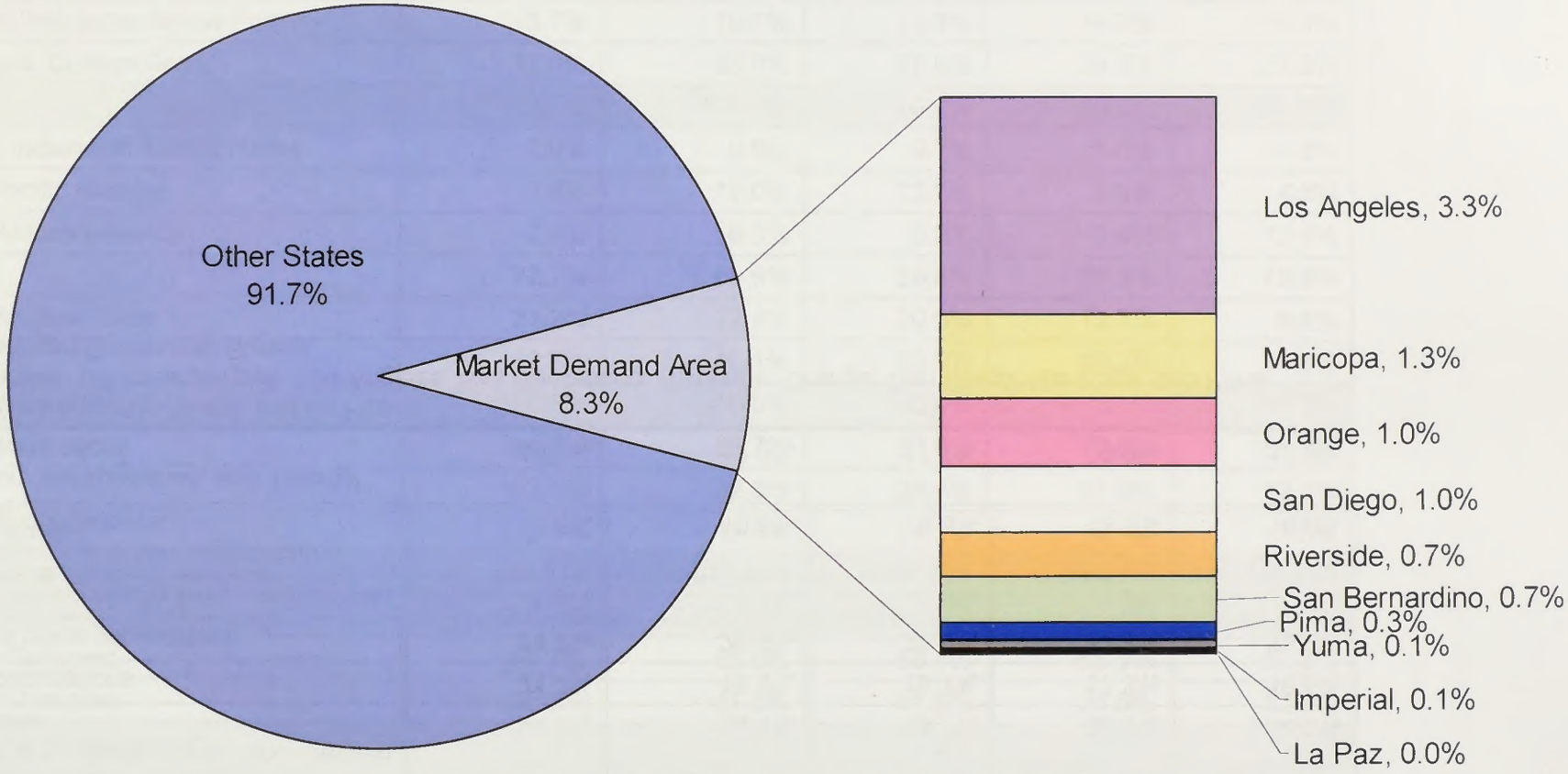
Characteristic	Planning Area EIA[1]	Planning Area MDA[2]	California	Arizona	US
Poverty Level[3]					
Percent of Families Below Poverty	14.5%	10.4%	9.7%	10.1%	9.8%
Percent of Population Below Poverty	15.7%	10.1%	13.1%	14.2%	13.3%
Pop 25+ yrs. College Grad.[3]	17.0%	35.0%	29.0%	25.5%	27.0%
Race[3]	100.0%	100.0%	100.0%	100.0%	100.0%
American Indian and Alaska Native	2.0%	0.9%	0.7%	4.5%	0.8%
Asian & Pacific Islander	1.4%	10.0%	12.7%	2.5%	4.5%
Black or African American	2.6%	6.3%	6.2%	3.4%	12.4%
White	72.7%	60.5%	59.8%	76.9%	73.9%
Other or Multiple Race	21.2%	22.3%	20.6%	12.7%	8.4%
Hispanic[3]	62.7%	40.1%	35.9%	29.2%	14.8%
Language Spoken at Home[3]	100.0%	100.0%	100.0%	100.0%	100.0%
English Only	44.8%	55.7%	57.5%	72.0%	80.3%
Spanish	53.1%	32.3%	28.4%	21.9%	12.2%
Other Language	2.1%	12.0%	14.1%	6.1%	7.5%
Total Housing Units[3]	152,477	8,973,021	13,174,781	2,605,095	126,311,823
Occupied Housing Units[3]	124,058	8,236,280	12,151,227	2,224,992	111,617,402
% Owner Occupied	67.7%	58.6%	58.4%	68.5%	67.3%
% Renter Occupied	32.3%	41.3%	41.6%	31.5%	32.7%
Persons Per Dwelling Unit[3]	3.0	3.0	2.9	2.7	2.6
Employment (2006 EDD, BLS)	127,296	11,730,510	17,029,900	2,848,000	144,427,000
% Unemployed	14.4%	4.4%	4.9%	4.9%	4.6%

TABLE 3-22
DEMOGRAPHIC PROFILE OF THE PLANNING AREA MARKET AREA V. CALIFORNIA, ARIZONA, AND THE US (CONT.)

Characteristic	Planning Area EIA[1]	Planning Area MDA[2]	California	Arizona	US
Occupation[3]					
Management, professional and related occupations	24.9%	33.4%	34.7%	32.6%	34.0%
Service occupations	21.7%	16.9%	16.7%	17.3%	16.5%
Sales and office occupations	24.7%	26.9%	26.0%	27.4%	25.9%
Farming, fishing and forestry occupations	6.6%	0.4%	1.3%	0.5%	0.7%
Construction, extraction, maintenance and repair occupations	11.5%	10.2%	9.6%	12.3%	10.0%
Production, transportation, and material moving occupations	10.7%	12.3%	11.7%	9.9%	13.0%

[1]EIA counties: Imperial, Yuma, and La Paz.
[2]MDA counties: EIA counties plus: Los Angeles, San Bernardino, Riverside, Orange, San Diego, Maricopa, and Pima.
[3]2006 American Community Survey

FIGURE 3-2
PLANNING AREA 10-COUNTY MARKET DEMAND AREA POPULATION



median age of 30.5 years and 30.3 years, respectively. Only La Paz County recorded a median age well above the national median (49.9 years to 36.4 years, respectively).

3.18.2.4 Household Income and Poverty

The median household income for the Planning Area MDA was $54,477 in 2006, about $6,000 higher than the national median income of $48,451. However, the median income for Orange County ($70,232) was substantially higher than the balance of the MDA, while the lowest median income was reported for La Paz County ($28,973). The proportion of population below the poverty level in the MDA was 10.1 percent, which was lower than the poverty level for the nation (13.3 percent). Within the MDA, the poverty level was substantially lower in Orange County (9.7 percent) compared to Imperial County (18.1 percent).

3.18.2.5 Education Level

The proportion of the population 25 years or older with a college degree was higher in the Planning Area MDA (35.0 percent) than the national average (27.0 percent). Within the MDA, the residents of the counties of Orange (42.9 percent) and San Diego (41.6 percent) recorded the highest proportion of population with college degrees. The lowest percentage of population with college degrees was reported for residents of La Paz County (10.9 percent).

3.18.2.6 Race and Ethnicity

The most noticeable demographic difference between the Planning Area MDA and the nation was with respect to race and ethnicity. When compared to the nation as a whole, the MDA recorded a significantly higher proportion of Asian/Pacific Islanders (10 percent) than the nation (4.5 percent), as well as other or multiple races (20.6 percent) compared to (8.4 percent) for the nation. The proportion of Hispanic residents in the MDA was 40.1 percent, which was significantly higher than reported for the nation (14.8 percent). Imperial County reported the highest percentage of Hispanic residents (75.7 percent) and La Paz County recorded the lowest percentage of Hispanic residents (22.6 percent) within the 10-county MDA.

3.18.2.7 Housing, Ownership, and Household Size

There were 9.0 million housing units in the Planning Area MDA, which represents about 14 percent of the 126.3 million housing units in the US in 2006. About 8.2 million of the housing units in the MDA are occupied, of which 59 percent are owner-occupied and 41 percent are rented. The percentage of housing that is owner-occupied is substantially higher nationwide (67 percent). Within the MDA, the highest proportion of homeownership was reported for La Paz County (80 percent), and the lowest

homeownership rate was reported for Los Angeles County (49 percent). The average household size for the MDA was 3 people and was larger than the nationwide average of 2.6 people.

3.18.2.8 Employment and Unemployment

The total non-farm employment in the Planning Area MDA during 2006 was 11.7 million or about eight percent of the 144.4 million total employees in the US. The unemployment rate in the MDA averaged 4.4 percent and was very close to the nationwide rate of 4.6 percent. Within the MDA, the highest unemployment rate was reported in Imperial County (15.4 percent) and the lowest in Orange County (3.4 percent).

3.18.2.9 Workforce Occupations

The occupational distribution for the Planning Area MDA was very similar to the states of Arizona and California and the US as a whole. The largest occupational category was management and professional occupations, representing about one-third of the labor force. The second largest occupational category was sales and office occupations with about one-quarter of the work force in this category. The next largest category was service occupations, which employed about 17 percent of the work force. Production, transportation, and material-moving occupations represented about 12 percent of the workforce. Construction, extraction, maintenance, and repair occupations represented about 10 percent of the workforce. Farming, fishing, and forestry occupations represented a very small proportion of the workforce (less than 1 percent).

3.18.2.10 Employment Forecast

Table 3-23 presents the forecasted employment growth of the Planning Area EIA. Employment is predicted to grow at a similar rate as the nation. By 2016 the Planning Area EIA is expected to employ 167,000 people, a 14.8-percent increase from 2006. Similarly, the nation is expected to experience 13.9-percent growth in employment during that same period.

TABLE 3-23
EMPLOYMENT GROWTH FORECAST FOR 2016

Employment	Planning Area EIA	California	Arizona	US
2006	145,523	17,173,500	2,885,070	144,427,000
2016	167,115	19,683,800	3,323,530	164,539,900
Increase	21,592	2,510,300	1,983,800	20,112,900
Percent Increase	14.8%	14.6%	15.2%	13.9%
Annualized Rate	1.38%	1.36%	1.41%	1.30%

Sources: California Employment Development Department.

US Department of Labor, Bureau of Labor Statistics.

3.18.2.11 Demographic Summary

The Planning Area MDA makes up about 8 percent of the population, employment, and the economy of the US and is greater than 48 of the 50 states. In general, the residents of the MDA are a little younger and are represented by a higher proportion of Hispanics than the states of Arizona and California or the nation. The median household income for the MDA is greater than the nationwide median household income.

3.18.2.12 Community Strength Indicators

In general, the Planning Area EIA has not performed as well as the nation as measured by several community strength indicators. These indicators show that population and employment growth within the EIA was nearly double that of the nation during the last 36 years; however, personal income grew at a rate only slightly higher than the national average, which would indicate that individual income growth is being outpaced at the national level. Compared with the nation, residents of the EIA have lower incomes, higher unemployment, and a lower proportion of the population have college degrees. Income is slightly more evenly distributed among the EIA residents than in the nation, but the economy is less diversified, which can increase the risk associated with economic downturns. The industry sectors that employment is concentrated in, agriculture and government, are usually more recession proof. One area of relative strength is the Housing Affordability Index, which reflects the lower cost of housing in the EIA compared with the nation (Table 3-24).

3.18.3 Social Trends

The Planning Area is sometimes the center of passionate discussions about recreational land access, land use, environmental preservation, and resource management. Social values for lands and natural resources vary greatly by individual and groups. Concerned citizens reported to the BLM that they value the ISD for the following (BLM 2003b):

- spirituality and solitude
- environmental preservation
- wilderness opportunities
- OHV recreation opportunities
- camping
- outdoor experiences and exploration

TABLE 3-24
INDICATORS OF COMMUNITY ECONOMIC STRENGTH

Community Strength Indicators and Comparison Categories	Planning Area EIA	US
Population Growth (Annualized rate, 1970-2006)	2.6%	0.6%
Employment Growth (Annualized rate, 1970-2006)	2.5%	1.4%
Personal Income Growth (Adjusted for Inflation, Annualized rate, 1970-2006)	3.1%	2.2%
Non-labor Income Share of Total in 2006	33.3%	37.1%
Median Age	32.4 yrs.	37.3 yrs.
Per Capita Income (2006)	$ 22,313	$ 26,371
Average Earnings Per Job (2006)	$ 37,212	$ 30,269
Education Rate (% of population 25 and over who have a college degree)	11.1%	14.5%
Education Rate (% of population 25 and over who have less than a high school diploma)	37.3%	21.0%
Employment Specialization	221	155
Rich-Poor Ratio (for each household that made over $100K, how many households made less than $30K)	7.2	8.7
Housing Affordability (100 or above means that the median family can afford the median house)	133	186
Change in Housing Affordability (% change in index 1990-2000; Positive means the area is more affordable).	20.2%	10.3%
Government share of total employment	23%	15%
Unemployment Rate (2007)	15.8%	4.6%

Source: Headwaters Economics, Economic Profile System, developed for BLM.

A majority of Americans are concerned about the environment, but do not think that the answer to environmental protection is forbidding the use of public lands. Seventy-eight percent of Americans say outdoor recreation, overall, has a "good effect" or "no effect" on the environment. Sixty-two percent sampled believe the environmental effects of outdoor recreation are "good." Eleven percent said outdoor recreation has a "bad effect" (American Recreation Coalition 1999).

Most Americans also believe that the key to environmentally safe recreation is responsible behavior. Forty-seven percent of Americans "strongly agree" with the following statement: "If people would just follow the rules in parks and other outdoor recreation areas, their use of the land would have no significant effects on the environment," and 42 percent "mostly agree" with this statement. Similarly, 90 percent "strongly" or "mostly agree" that "most recreation is compatible with environmental protection when done responsibly." However, 76 percent say they are "very concerned

that people who engage in outdoor recreation hurt the environment by leaving trash and damaging the landscape" (American Recreation Coalition 1999).

Survey data indicates that most Americans believe that outdoor recreation can promote environmental responsibility. Eighty-nine percent "strongly" or "mostly agree" with the statement: "Outdoor recreation benefits the environment because it gives people more of a reason to care about environmental protection." Eighty-six percent agree with the statement "spending time outdoors gives people the incentive to take care of the environment properly" (American Recreation Coalition 1999).

3.18.4 Affected Users

The stakeholder types presented in this section were created to facilitate the discussion of social values and impacts. While it is believed that this typology is a reasonably accurate generalization of the types of people with interests in the Planning Area, particular views of individuals do vary. The user-community typology was derived from the ongoing BLM outreach and consultation process associated with the Planning Area. Some members of the public may identify with more than one of these groups. Use of the term group is not meant to imply that these individuals are members of a particular organization. They do share values, beliefs, attitudes, and activities. In that sense, the term community is used to refer to them. These user-communities are briefly described below in order of their relative size.

3.18.4.1 The OHV Community

In California, there are 3.5 million OHV enthusiasts—14.2 percent of all households (California State Parks 2002). The Arizona Game and Fish Department's OHV Program states that OHV recreation use on public lands has increased significantly:

> Since 1977 the increased use of OHVs has out-paced Arizona's population growth. OHV use has more than doubled, while the population has increased by slightly more than 65 percent. A study completed in 1990 estimated the number of OHVs (4X4s, buggies/sand rails, [all-terrain vehicles (ATVs)], motorcycles, and snowmobiles) in Arizona to be over 550,000. (Arizona Game and Fish Department 2009)

The *Imperial Sand Dunes Visitor Research Case Study* (BLM 1993) characterizes visitors to the Planning Area as predominately white (68 percent), relatively young (85 percent are 45 years of age or younger), majority male (66 percent), and most having at least a high school education (91 percent). Most visitors are from California (82 percent), although many visitors are from Arizona (15 percent). The activity most visitors participate in is OHV riding (90 percent). However, only one third listed OHV riding as the primary reason for visiting the Planning Area. Other reasons included: the dunes,

friends, open spaces, play, accessible, curiosity, to get away, vacation, and to race. The majority of visitors (94 percent) learned about the ISD from friends and family.

Participation in outdoor activities can greatly increase family interaction and foster cohesion. Numerous recreational users identified building family values and family interaction as important reasons why they enjoy the Planning Area. Several individuals stated at BLM public comment meetings that participation in recreational opportunities within the Planning Area gave their teenage children positive social interactions. Some members of the public attributed their children's lack of interest in drugs to their increased interest in recreational use of the ISD. Numerous comments from the public indicated that the Planning Area has been used by extended families for several generations (BLM 2003b).

Most Americans believe that young people should participate in recreation. A survey by *Outdoor Recreation In America 1999: The Family and the Environment* (American Recreation Coalition 1999) showed that 72 percent of the participants believed that outdoor recreation promotes good health, 70 percent that outdoor recreation creates shared experiences family and friends can bond over, 69 percent that outdoor recreation teaches appreciation of nature, 68 percent that it helps children develop important physical skills, 65 percent that outdoor recreation builds self esteem and personal growth, and 62 percent that it helps children develop important interpersonal skills.

Many recreational users have concerns about the future of OHV recreational use of the public land in the California desert. The number of acres of public lands in the California desert that are open to OHV use has decreased since the Wilderness Act of 1964 designated approximately 1 million acres of California as wilderness. In addition, between 1968 and 1978, there were 14 additional areas that were designated as wilderness. Furthermore, wilderness acts or monument designations in 1984, 1992, 1994, and 1999 closed or restricted motor vehicle access by more than 8,581,259 acres. As summarized by California State Parks:

> The California Desert Protection Act of 1994 affected OHV recreation through its wilderness designations and through the transfer of BLM land to the National Park Service. The California Desert District Office of the BLM managed 13.5 million acres, the majority of which was available for OHV recreation prior to passage of the California Desert Protection Act. Of the original 13.5 million acres, 6.4 million acres (48 percent) were closed [to OHV use] as a result of wilderness area designations and land transfers to the National Park Service. (California State Parks 2002).

The number of participants in OHV activities, as a whole, and within the Planning Area and elsewhere has increased in the past few decades, while the amount of public land on which to participate has decreased. "Since 1980, the acreage available to Green Sticker vehicles for recreation has shrunk 48 percent in our deserts alone, while off-

highway vehicle registrations have increased 108 percent" (California State Parks 2002). There has been a 30 percent increase in the number of dirt bike registrations between 1983 and 2000, a 96 percent increase in the number of all-terrain vehicle registrations between 1983 and 2000, a 96 percent increase in the number of dune buggy and sand rail registrations between 1983 and 2000, and a 74 percent increase in the number of street licensed four-wheel drive vehicle registrations between 1994 and 2000.

This situation has increased recreationists' concerns about OHV access to public lands. These concerns are expressed in essentially two forms:

- OHV access may be reduced to the point that crowding will diminish quality of their recreational experience,
- OHV access may not continue to be available for future generations

Based on comments received by the BLM (2003b), the list below briefly summarizes the views of the OHV community. In general, OHV enthusiasts have become more informed about environmental concerns and environmental politics within the Planning Area during the past decade, and OHV groups are occasionally funding their own environmental surveys. In general, the OHV community believes that:

- They do not harm the environment by their recreational activities within the Planning Area.
- They have considerable respect for the land and the species that live there.
- Recent biological surveys suggest that recreational use is compatible with species conservation.
- Species conservation concerns are used politically by environmental groups to close the ISD to OHV use (BLM 2003b).

Through the public comment process, a type of irresponsible, non-traditional OHV recreationist was also identified. This type operates OHVs in an unsafe manner and behaves in disruptive and troublesome ways. Mainstream OHV recreational users express concerns about this small number of people who cause problems within the Planning Area. They feel that the irresponsible OHV recreationists give OHV enthusiasts a bad reputation and make the OHV community more vulnerable to attack by opponents (BLM 2003b).

3.18.4.2 The Environmental Community

Based on the comments received during the public comment period for the 2003 ISD RAMP/EIS, the environmental advocacy groups recreationally use the ISD as a hiking area. They desire a quiet, peaceful time of reflection and observation of nature during

their visit. Members of this group have indicated that the noise from OHV recreation and from freight trains that run along the northeast side of the dunes detract substantially from their recreational experience. They believe that wild, natural places in which to enjoy solitude and peace are increasingly difficult to find. They feel a need to establish more WAs to preserve threatened and endangered species and their natural habitats, and to provide a place to get away from mechanized, modern life.

According to the American Recreation Coalition (1999), 51 percent of the environmental leaders and activists say to experience nature is a very important reason to participate in outdoor recreation. This percentage was the same for environmental donors (those who are willing to pay to improve the environment, but with little time to get involved themselves).

Generally, environmental advocacy groups support a more restrictive plan for OHV recreation in the Planning Area. The public input process revealed that people were concerned that the management of the Planning Area would not provide enough acreage for viable habitat for threatened and/or endangered species, and other dune endemic species (BLM 2003b). They also expressed concerns about OHV activities within the Planning Area in terms of air pollution, litter, habitat destruction, and disturbance to native plant species and wildlife. Many thought that dividing the acreage evenly for recreational use and protection would be desirable. Many environmentalists indicated that they were not confident that OHV recreational use could occur without harming the environment. They believe that OHV recreation makes the Planning Area undesirable and unavailable for the recreational use of the area by non-mechanized users of all kinds (BLM 2003b).

The conditions and resources on public lands are important to the environmental advocacy groups. Many members of these groups appreciate just knowing that these areas exist, even if they never visit the areas. Members of these groups feel strongly that the public lands must be managed to protect the resources for future generations. Overall, the environmental advocacy groups that participated in the public comment process for the 2003 ISD RAMP/EIS were concerned that OHV recreation was not compatible with their desired recreational experiences or with resource preservation, conservation, and protection (BLM 2003b).

3.18.4.3 On-Site Vendors

Vendors are merchants who temporarily engage in commercial activities within the Planning Area during the active vending season. This vending season is defined by the BLM as October 1 through May 31. There are no permanent facilities for vendors other than a gravel pad for vendors near the Cahuilla Ranger Station. Vendors typically sell from, and live in, tents or RVs. Some set up substantial encampments and tent stores or cafes, while others set up a small ramada or sell from a vehicle. Vendors are allowed to

set up after noon on Thursdays and they must vacate the area by noon on Monday. In comments to the BLM, vendors expressed a number of common beliefs and views:

- Vendors believe that they perform a public service in providing supplies and services to the recreational users within the Planning Area.
- Vendors have stated that their businesses are highly profitable, even when operated during the slower periods of the recreational season.
- Vendors believe that they have a right to continue to operate in the Planning Area
- Many vendors expressed resentment regarding the regulations under which they are allowed to operate, such as the rule requiring that they pack up and leave every week. In the view of the vendors, this rule causes a great deal of effort and results in worse service and fewer products for the OHV community. The vendors believe that their services should be available daily, not just on weekends and that they should be able to set up and live there for the season rather than having to break down and leave every week.
- Many of the vendors believe that they have, or should have, the right to live where they vend to protect their business from thieves and vandals.
- Few vendors acknowledge the negative impacts they have on businesses in nearby communities.

The vendors strongly support unrestricted vending and season-long residential use of the vending area for the vendors in order to provide better services and a wider range of products (BLM 2003b).

3.18.4.4 Business Owners in Nearby Communities

In comments to the BLM, OHV-related business owners suggested their operations were highly profitable. Most felt that any restriction on OHV recreation could have negative impacts on their businesses. In their views, some proposals would drive some businesses into bankruptcy. For example, nightly curfews have been proposed to cut down on crime and disruptive behavior; such a curfew could make it difficult for firms that sell driving lights for OHVs. A curfew would also eliminate a time for OHV recreation enjoyed by many, which might also cause more crowding during the day in popular areas. A weekend nighttime curfew for Competition Hill has been put into effect because of public safety concerns.

Business owners felt that restricting visitation to the Planning Area would most likely have the largest negative financial impact to the OHV-related businesses. The OHV-

related business owners support increased OHV recreation and indicate that they believe jobs would be lost if OHV recreation were to be severely restricted (BLM 2003b).

On the other hand, because on-site vendors compete with local business owners, some local business owners believe that they may fail financially if unrestricted vending is allowed in the Planning Area. Many business owners believe that they are unable to compete with on-site vendors since the latter are nomadic and do not have the expenses associated with fixed-base operations, such as a mortgage, property maintenance, insurance, and property taxes.

3.18.4.5 Community Representatives

Numerous officials from surrounding local communities state that they support OHV recreation in the Planning Area. They stated that the recreational use within the Planning Area provides jobs for their communities at grocery stores, restaurants, gas stations, medical facilities, as well as vehicle sales, repair, and supply shops. Some officials indicated that the money that is spent in their communities then is redistributed in the community when the local residents spend associated income. The affect of the money spent by the recreational users is thought to be significant due to the cumulative affect of the jobs that are supported by these expenditures (BLM 2003b).

The increased law enforcement within the Planning Area includes the use of law enforcement officers from nearby communities. Currently, the use of local law enforcement officers is funded by a grant. The local community support of providing law enforcement officers for the Planning Area may change if continued external funding is not available to support their efforts (BLM 2003b).

3.18.4.6 The Quechan Tribe

The ISD are primarily associated with the Quechan, who lived along the Colorado River in the Yuma vicinity (Russell et al. 2002). The sand dunes appear in traditional Quechan origin stories and other story cycles and also in the oral traditions of other nearby tribes (Russell et al. 2002). The Quechan view the sand dunes as an important part of their cultural traditions, but visit them infrequently. When they do visit, it is to meditate, walk, and experience the dune environment. Tribal representatives report being reasonably pleased with the balance between preservation and OHV recreation, but are concerned about the plants and animals as well as the pollution from the powerful machines. They also expressed concern for the safety of the OHV recreationists (Russell et al. 2002).

3.18.5 Economic Characteristics

The economy of the Planning Area EIA represents about a half of one percent of the California economy and less than one-tenth of one percent of the US economy. As is indicated in Table 3-25, the gross domestic product for the EIA region in 2006 is estimated to be $7.9 billion.

TABLE 3-25
2006 GROSS DOMESTIC PRODUCT

	Planning Area EIA	California	US
Gross Domestic Product ($ billions)	$7.9 B	$1,742.2 B	$13,178.4 B
Planning Area EIA as a % of each region	100.0%	0.5%	0.1%

Source: US Dept. of Commerce, Bureau of Economic Analysis

The distribution of employment by industry sector for the Planning Area EIA is somewhat similar to the state of California and the nation as a whole, with some noticeable exceptions. Although private sector employment is predominantly service-oriented, a higher proportion of employees are in the goods producing sector (21 percent) as compared to California or the nation (18 percent) Specifically, a higher percentage of the EIA's employment is found in the natural resource and agricultural categories than California or nationally (Table 3-26). In contrast, there is a significantly smaller proportion of employment in the financial area (4 percent versus 7 percent) and the professional and business service sector (10 percent versus 18 percent) when comparing the EIA with the nation as a whole.

TABLE 3-26
DISTRIBUTION OF PRIVATE SECTOR EMPLOYEES

	Planning Area	California	US
Goods-producing	21.2%	17.8%	18.1%
Natural Resources and Mining	1.7%	0.4%	0.6%
Agriculture, forestry, fishing & hunting	1.5%	0.2%	0.1%
Mining	0.2%	0.2%	0.5%
Construction	9.7%	6.9%	6.1%
Manufacturing (Including forest products)	9.8%	10.5%	11.4%

TABLE 3-26
DISTRIBUTION OF PRIVATE SECTOR EMPLOYEES (CONT.)

	Planning Area	California	US
Service-providing	78.8%	82.2%	81.9%
Trade, Transportation, and Utilities	31.4%	22.0%	22.3%
Information	1.3%	3.8%	2.8%
Financial Activities	4.1%	7.7%	7.4%
Professional and Business Services	9.9%	19.3%	17.5%
Education and Health Services	14.1%	13.5%	16.2%
Leisure and Hospitality	14.3%	11.7%	11.1%
Other Services	3.6%	4.2%	4.6%
Unclassified	0.1%	*	*
Total	100.0%	100.0%	100.0%

*Less than 0.1%
Source: California Employment Development Department.

To produce the estimates of employment and the value of regional product, a regional input–output model was developed for the Planning Area EIA. This area includes Yuma and La Paz counties in Arizona, as well as Imperial County and the Mecca and Blythe areas of Riverside County in California. The regional input-output model was based on software and data provided by Impact Analysis for Planning (IMPLAN)/Pro.[1] The value of the IMPLAN/Pro system was to provide a basis for measuring the size of key economic sectors of the EIA in terms of output, income, and employment. In addition to providing measurements of existing economic conditions for the EIA and the subset of BLM managed lands, the input-output system also provided the ability to model the expected impact of changes originating from outside the Planning Area's EIA based on planning alternatives for the proposed BLM resource management plan.

The cumulative total economic impacts (direct, indirect, and induced) were determined for each of the BLM-proposed planning alternatives for the Planning Area's EIA and are presented in Chapter 4. The economic impact definitions listed below explain the terms that will be used in the following paragraphs and tables:

Output. Output is a measure of the sales generated within the local economy (i.e., the Planning Area's EIA). The total output (cumulative impact) has three subcomponents: the direct sales impact, the indirect sales impact, and the induced sales impact.

[1] IMPLAN (Impact Analysis for PLANning) was originally developed by the US Department of Agriculture, Forest Service in cooperation with the Federal Emergency Management Agency and the BLM to assist the Forest Service in land and resource management planning.

- ***Direct sales*** impacts occur when a recreational visitor to the Planning Area purchases a meal in a local area restaurant.

- ***Indirect sales*** impacts occur when businesses make purchases from other businesses, (e.g., supplies or services). In turn each of the indirect businesses must also make purchases from their suppliers.

- ***Induced sales*** are generated by the purchases of employees and owners of the businesses with direct, indirect, and induced sales. The employees and owners spend their incomes from the compensation for labor and ownership that was required to produce the direct output, as well as all indirect and induced output required by the direct sales.

- ***Cumulative sales*** impacts or the total output impact is the sum of the direct impact, the indirect impact, and the induced impact as listed above. The cumulative impacts are also measured for employment, income, and value added.

Employment. Employment is a measure of the amount of full and part-time annual average employment, including self-employed proprietors, within the Planning Area economy.

Value added. Value added is a measure of the amount of value created within the economy. In this study it is the amount of value created within the Planning Area impact area's economy. There are four value-added subcomponents.

- ***Employee compensation*** includes the wages and salaries of workers who are paid by employers as well as the cost of benefits such as health and life insurance, retirement payments, and non-cash compensation.

- ***Proprietary income*** consists of payments received by self-employed individuals as income from the private businesses they own. This includes income received by many private business owners ranging from a lawn care service or a dry-cleaning business, as well as doctors, attorneys, consultant, and other professionals that own their business.

- ***Other property type income*** consists of payments for interest, rents, royalties, and dividends. Payments to individuals in the form of rents received on property, royalties from contracts, and dividends paid by corporations are included here as well as corporate profits earned by corporations.

- ***Indirect business taxes*** consist of excise taxes, property taxes, fees, licenses, and sales taxes paid by businesses. These taxes occur during the normal operation of businesses, but do not include taxes on profit or income.

3.18.5.1 Economic Characteristics of the Planning Area EIA

The Planning Area EIA generates about $10.2 billion in gross regional product as measured by value added (Table 3-27). The total output (sales) of the EIA is approximately $23.1 billion, and the total employee income is $6.1 billion. The $23.1 billion in output within the EIA supports over 168,000 jobs. The total value added per job is approximately $60,300.

TABLE 3-27
PLANNING AREA EIA
TOTAL ECONOMIC VALUE ADDED BY MAJOR SECTOR DURING 2007

Major Category	Value Added (millions)	Number of Employees
Agriculture, forestry, fish & hunting	$ 1,635.0	34,040
Retail trade	901.3	19,743
Real estate & rental	841.0	2,817
Health & social services	534.6	11,004
Construction	441.7	8,173
Wholesale trade	399.8	4,463
Manufacturing	390.0	5,835
Accommodation & food services	266.1	9,989
Transportation & Warehousing	254.6	4,507
Professional–scientific & tech services	226.9	4,011
Other services	225.1	8,697
Utilities	215.1	694
Finance & insurance	192.9	2,768
Administrative & waste services	178.3	4,481
Information	152.6	1,362
Mining	25.8	172
Management of companies	28.5	419
Educational services	26.5	804
Arts–entertainment & recreation	20.4	823
Government & non-North American Industry Classification System	3,200.3	43,623
Total	$ 10,156.5	168,424

Source: IMPLAN/Pro, Planning Area EIA, 2007.

The largest non-government sector of the EIA economy in terms of value added is agriculture. This sector added $1.64 billion to the local economy while employing over 34,000 people. Retail trade was the next most important sector, contributing $901.3 million and employing 19,700 people, followed by the real estate sector, which added

$841.0 million to the areas economy while employing 2,817 people. Another important sector is the health and social services sector, contributing $534.6 million and employing over 11,000 people. The government sector employs 43,600 people and adds $3.2 billion to the impact area's economy.

When the above-listed sectors are ranked by employment, the largest sector of the EIA economy is government and non-North American Industry Classification System. In other words the public sector accounts for the largest single source of employment in the EIA (Figure 3-3). The agricultural sector is the next largest sector in terms of employment followed by retail trade.

3.18.5.2 Mineral Resources

3.18.5.2.1 Baseline Economic Conditions

3.18.5.2.1.1 Locatables

As of September 2008, there was one mining claim filed on BLM-administered land within the Planning Area. The cost of a mining claim is $140 annually. The mining claim entitles the holder to the mineral rights, but not to operate a mine. To operate a mine the owner of the claim must also file a Mining Notice for exploration activities of less than five acres or a Plan of Operations for mining of more than five acres.

No notices have been filed with BLM on the claim. No measurable commercial activity for mining exists. No Plans of Operations have been submitted to the BLM to mine within the Planning Area. The existing conditions for locatables on BLM lands within the Planning Area do not yield an economic output. Therefore, no economic baseline exists for locatable minerals, and they are not addressed further in this section.

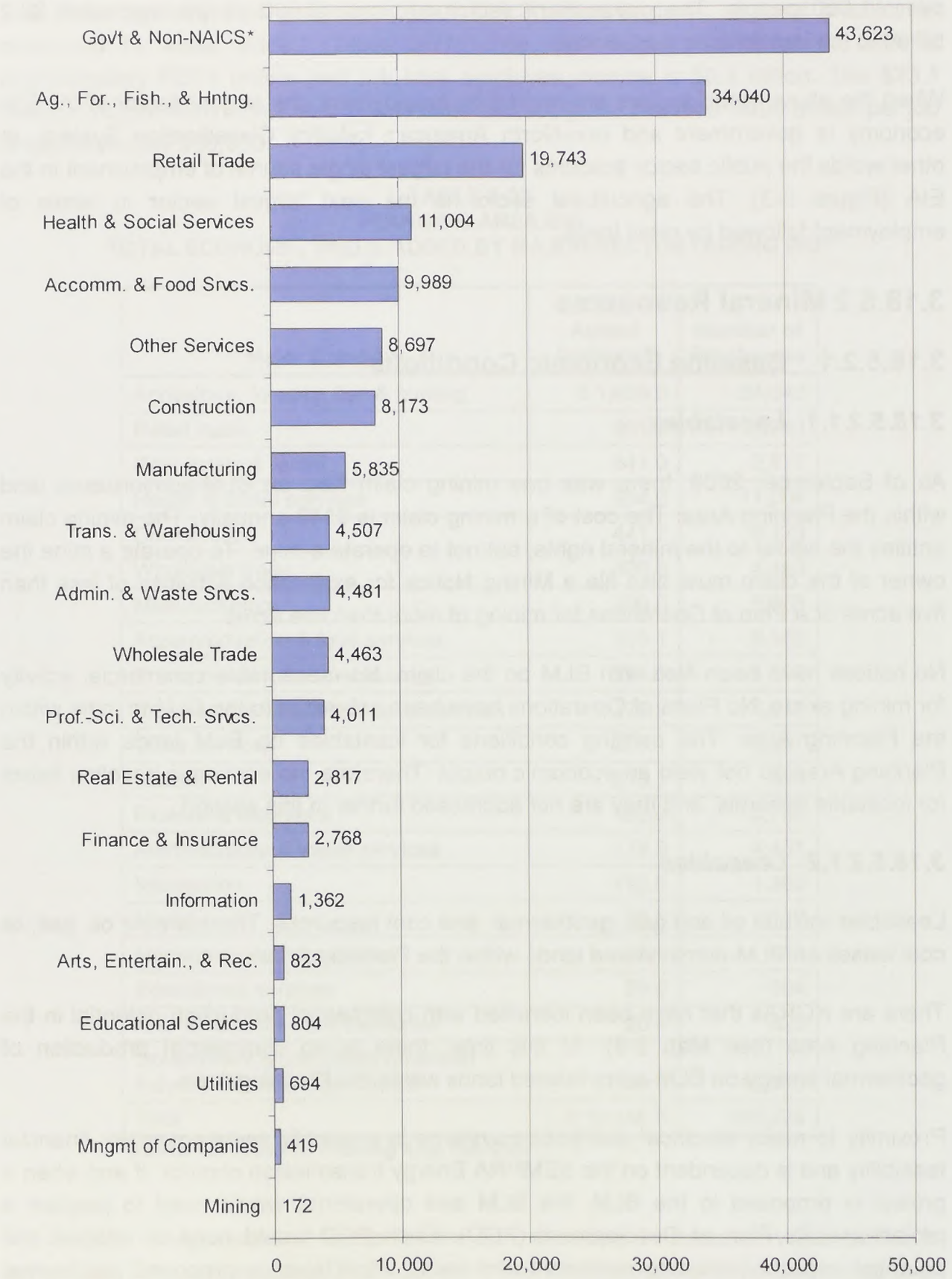
3.18.5.2.1.2 Leasables

Leasables include oil and gas, geothermal, and coal resources. There are no oil, gas, or coal leases on BLM-administered lands within the Planning Area.

There are KGRAs that have been identified with commercial production potential in the Planning Area (see Map 3-8). At this time, there is no commercial production of geothermal energy on BLM-administered lands within the Planning Area.

Proximity to major electrical distribution systems is a specific requirement for financial feasibility and is dependent on the SEMPRA Energy transmission corridor. If and when a project is proposed to the BLM, the BLM and operator(s) would need to prepare a project-specific Plan of Development (POD). Each POD would need to address the potential impacts (including economic and social impacts) of a proposed geothermal mineral lease and development.

FIGURE 3-3
EMPLOYMENT BY SECTOR (JOBS IN 000s)



3.18.5.2.1.3 Saleables

There are no commercial saleable resource activities (e.g., sand and gravel extraction) on BLM lands within the Planning Area, although there is a free-use permit granted by BLM to the County of Imperial for extraction in the Glamis area. This activity is outside of the ISD SRMA. There are large sand and gravel extraction operations occurring to the west of the Planning Area boundary along the east side of the canal. There are significant potential resources for sand gravel extraction within the Planning Area. Sand and gravel operators are not required to pay a rent for using public land. The rate for sand and gravel disposal (extraction) from public lands within the ECFO area is $1.10 per cubic yard or $0.73 per ton. As there is no economic activity in sand and gravel extraction within the Planning Area, no economic baseline exists, and the resource is not addressed further in this section.

3.18.5.2.2 Program-specific Sociocultural Conditions

Gold mining is a major historic theme in California, particularly in the northern part of the state. Gold mining is also a major historic theme in several areas near the Planning Area. The following were gold mining districts near the Planning Area in the late nineteenth century:

- Julian and Cuyamaca areas, approximately 80 miles to the west
- Along the Lower Colorado River, about 30 miles east
- Along the Cargo Muchacho Mountains, about 6 miles to the northeast

In the entertainment media and in popular culture, nineteenth-century mining is associated with rugged individualism, the frontier, and nation building. Modern mining is not well known to or understood by the general public and has no associated romance and mythology. While the remains of nineteenth-century mining are considered valuable heritage resources, modern industrial mining facilities are generally viewed as eyesores.

Environmentalists and Native Americans have concerns about and considerable resistance to expanding mineral extraction operations or new operations in the desert surrounding the Planning Area. The OHV community has no particular views on mineral extraction as long as it does not restrict access to the Planning Area. No mineral resource operation exists within the Planning Area and none are proposed.

3.18.5.3 Recreation Management

3.18.5.3.1 Baseline Economic Conditions

The baseline economic conditions for recreational activities in the Planning Area were derived from a mail survey conducted during the period of March 2006 through early

May 2006.[2] The survey was sponsored by the United Desert Gateway and BLM. The study titled, "A Profile of the 2006 Visitors to the Imperial Sand Dunes Recreational Area," was authored by Dr. Glen E. Haas and Dr. Kimberly Collins (2008). The existing condition economic baseline information for recreation in the Planning Area as detailed in this chapter, was derived from data provided in Part 2 of the 2006 survey.

The 2006 survey sample was drawn from overnight registration records for Planning Area users that were collected and maintained by the Imperial County Sheriff's Office from November 1, 2005 through March 10, 2006. A systematic sample (every 20th registration form) yielding a total of 800 forms was drawn and roughly 300 completed questionnaires were returned. The data were entered into a spreadsheet and descriptive statistics were derived using the Statistical Package for the Social Sciences statistical software package.

In Part 2 of the study, expenditure information was projected for nine expenditure categories. The following Table 3-28 summarizes the survey data with some modification. First, the actual 2006 overnight camping data provided by BLM was used in the table value rather than an estimate. Second, an outlier analysis was performed on the raw data set. Outliers were removed in the grocery and supplies, gasoline and oil, and vehicle maintenance and repair categories. No outliers were found in the other categories.

Based on the estimate provided in "A Profile of the 2006 Visitor to the Imperial Sand Dunes Recreational Area," the current conditions render 350,000 towing vehicle visits annually (i.e., 1.4 million visitors divided by 4 visitors per vehicle).

Using the per visitor group spending values with the outliers removed, the percentage of responses indicating expenditures in each category were multiplied by 350,000 estimated vehicle visits (Part 2, Page 4) to obtain total expenditures for the season. Thus, the Planning Area accounted for $166,462,082 in total visit-related expenditures. Each figure was multiplied by the mean percent of dollars spent in the region. Thus, $112,329,897 of total expenditures (67.5 percent) are believed to be spent in the Planning Area region. This implies that each vehicle visit averaged $475.61 in total expenditures, of which $320.94 was spent in the Planning Area region.

Based on the IMPLAN model for the Planning Area EIA, the baseline economic impacts of recreation are reported in Table 3-29. The total cumulative impact (direct, indirect, and induced) generated by recreational use of the Planning Area is about $171 million per year. In terms of employment, the baseline conditions result in 2,139 jobs with $67,493,951 in labor income. Tax revenue generated is estimated to be $18,122,099 million.

---

[2] No independent review of the accuracy of the 2006 survey data was conducted.

TABLE 3-28
BREAKDOWN OF EXPENDITURES BY VISITORS AND
PERCENTAGE OF VISITOR DOLLARS SPENT IN THE PLANNING AREA REGION

Expenditure Category	Expenditures Based on 1.4 Million Visitors or 350,000 Vehicles	Percent Spent in the Planning Area Region	Planning Area Estimated In-Region Expenditures
Overnight Camping Permits	$ 3,730,820	95.2%	$ 3,551,740
Motels, Hotels, RV Parks, Resorts	$ 1,839,786	100.0%	$ 1,839,786
Restaurants and Bars	$ 13,372,450	86.6%	$ 11,580,541
Groceries and Supplies	$ 52,978,800	56.4%	$ 29,880,043
Gasoline and Oil	$ 64,970,500	60.4%	$ 39,242,182
Vehicle Maintenance and Repair	$ 4,830,000	78.7%	$ 3,801,210
Entertainment and Recreation Entrance Fees	$ 2,140,810	93.1%	$ 1,993,094
Souvenirs and Clothing	$ 18,243,866	92.9%	$ 16,948,551
Retail Sales	$ 4,355,050	80.2%	$ 3,492,750
Totals	$ 166,462,082	67.5%	$ 112,329,897

Sources:
Kimberly Collins 2006.
CIC Research, Inc., February 2009.

TABLE 3-29
BASELINE ECONOMIC CONDITION FOR RECREATIONAL USE OF THE PLANNING AREA

Baseline Economic Condition—350,000 Annual Vehicle Visits to Planning Area			
Category	Direct	Indirect & Induced	Cumulative
Dollar Value	$112,329,897	$ 58,370,012	$170,699,909
Employment	1,625	515	2,139
Labor Income	$ 47,496,321	$ 19,997,630	$ 67,493,951
Property Income	$ 13,011,561	$ 10,554,842	$ 23,566,404
Tax Revenue	$ 14,854,336	$ 3,267,763	$ 18,122,099
Value Added	$ 75,362,270	$ 33,820,254	$109,182,525

Source: CIC Research, Inc. and MIG IMPLAN/Pro (base year 2007).

Table 3-30 provides the economic impact based on the IMPLAN modeling by industry sector for the study region. As the table indicates, the Planning Area activity accounts for a significant percentage of Federal Government Enterprise (8.5 percent), Entertainment and Amusement (6.4 percent), Gas Stations (5.3 percent), Food and Beverage (4.4 percent), and Auto Repair (4.2 percent). The economic impact on other sectors of the economy attributable to Planning Area activities is fairly modest.

TABLE 3-30
2007 IMPLAN MODEL ESTIMATE OF THE ECONOMIC IMPACT FROM RECREATIONAL ACTIVITIES FOR THE THREE-COUNTY EIA*

Industry	Impact (millions)	Baseline Economy (millions)	Percent of Baseline Economy
Ag Excluding Cattle	$ 0.817	$ 3,128.520	0.0%
Cattle Ranching	$ 0.040	$ 162.295	0.0%
Mining and Extractive Industries	$ 0.091	$ 28.637	0.3%
Sand and Gravel	$ 0.002	$ 21.150	0.0%
Utilities	$ 2.432	$ 397.156	0.6%
Construction	$ 0.003	$ 957.715	0.0%
Maintenance	$ 0.863	$ 143.843	0.6%
Manufacturing	$ 4.029	$ 2,155.013	0.2%
Wholesale Trade	$ 3.168	$ 2,270.296	0.1%
Food and Beverage Stores	$ 30.674	$ 693.572	4.4%
Gas Stations	$ 39.587	$ 745.056	5.3%
Other Retail	$ 24.652	$ 3,644.454	0.7%
Transportation and Warehousing	$ 3.726	$ 502.777	0.7%
Information	$ 2.136	$ 325.566	0.7%
Finance and insurance	$ 2.946	$ 376.015	0.8%
Real Estate and Rental	$ 11.061	$ 1,321.204	0.8%
Professional-Scientific and Tech Services	$ 2.580	$ 387.780	0.7%
Management of Companies	$ 0.642	$ 65.369	1.0%
Administrative & Waste Services	$ 2.948	$ 319.239	0.9%
Educational Services	$ 0.255	$ 44.696	0.6%
Health and Social Services	$ 5.067	$ 892.217	0.6%
Entertainment and Amusement	$ 2.237	$ 34.826	6.4%
Accommodations	$ 2.279	$ 84.239	2.7%
Eating and Drinking Establishments	$ 14.176	$ 466.520	3.0%
Auto Repair	$ 4.359	$ 103.905	4.2%
Other Services	$ 1.262	$ 188.747	0.7%
Other Government and NEI	$ 4.969	$ 3,591.694	0.1%
Federal Government Enterprise (excluded. USPS & Elec. Gen)	$ 3.699	$ 43.610	8.5%
Totals	$170.700	$23,096.110	0.7%

Source: IMPLAN, Minnesota IMPLAN Group, Inc. (MIG, Inc.), 2007 Model, 2002 Economic Census and CIC Research, Inc. March 25, 2009
*The three-county EIA is defined as Imperial County, California, Yuma and La Paz counties, Arizona

3.18.5.3.2 Program-specific Sociocultural Conditions

As presented above, the recreation management issue that dominates the Planning Area is the tension between environmental preservation and OHV recreation. These issues have been discussed in some detail in Section 3.18.4—Affected Users and will not be revisited here.

3.18.5.4 Transportation and Public Access

3.18.5.4.1 Routes of Travel and Rights-of-way—Roads

Routes of travel within the Planning Area are illustrated on Map 2-27. There are a total of 228.21 miles of routes of travel within the Planning Area, including paved and unpaved, and open and limited routes (refer to Table 2-15). The majority of annual economic costs for existing ROWs are associated with the maintenance of paved and unpaved roadways. The average annual cost per mile of maintained paved ROW is approximately $3,000 to $5,000 per mile. The average cost estimate for this analysis was $4,000 per mile of paved roadway. The average annual cost for maintenance of unpaved roadways is approximately $1,500. The estimated annual maintenance for the 228.21 miles of travel routes within the Planning Area yields an annual direct maintenance cost of about $477,000. Using the IMPLAN model, the baseline economic condition of annual maintenance activities for existing ROWs is listed in Table 3-31.

TABLE 3-31
BASELINE ECONOMIC CONDITION OF ANNUAL ROADWAY MAINTENANCE COSTS FOR ROWs WITHIN THE PLANNING AREA

Baseline Economic Condition—228.21 Miles of Routes of Travel Maintenance			
Category	Direct	Indirect & Induced	Cumulative
Dollar Value	$477,065	$276,307	$753,372
Employment	4.26	2.50	6.76
Labor Income	$193,302	$93,699	$287,002
Property Income	$25,155	$42,011	$67,166
Tax Revenue	$6,505	$16,866	$23,371
Value Added	$224,962	$152,576	$377,539

Source: CIC Research, Inc. and MIG IMPLAN/Pro (base year 2006).

The approximately 228 miles of routes of travel within the Planning Area require about $477,000 direct output within the EIA for annual maintenance. The $477,000 in annual direct impact generated a total cumulative impact (direct, indirect, and induced) of about $753,000 in output, including an estimated $377,000 in total value added. The total value added within the EIA included $287,000 in labor income, about $67,000 in

property income, more than $23,000 in tax revenue, and about seven jobs (6.76) in annual employment.

3.18.5.5 Lands and Realty Management

3.18.5.5.1 Baseline Economic Conditions

The baseline economic condition for the lands and realty program focuses on authorizations for communication sites, access roads, renewable energy sites, and other ROWs. The Planning Area is a contiguous area that is roughly 40 miles long and 3 to 12 miles wide.

3.18.5.5.1.1 Utility Corridors

A joint-use utility corridor designated as Corridor L and described in the CDCA Plan crosses from east to west along the southern portion of the Planning Area (Map 2-28, utility corridor map). The CDCA Plan assigned Corridor L a width of 2 to 5 miles. In the Planning Area, the corridor averages about 2 miles wide (see Map 2-28). A 500kV transmission line, a 161kV transmission line, and several buried fiber optic networks and telephone lines have been constructed within the corridor. The length of the southern utility corridor crossing the Planning Area is 9 miles.

San Diego Gas and Electric reported that the average cost per mile for maintenance of high-voltage transmission corridors was $35,000 per mile. The total expected cost for maintenance of the 9-mile San Diego Gas and Electric transmission corridor would be $315,000 (San Diego Gas and Electric 2007).

A 39-mile utility corridor and UPRR ROW runs along the eastern boundary of the ISD SRMA. This contingency utility corridor is 2 miles wide and can be brought forward into the CDCA Plan after simultaneous plan amendment and EIS on an identified project. The majority of annual economic costs for existing ROWs are associated with the maintenance of paved and unpaved roadways and periodic testing and inspection of buried utilities. The average annual cost per mile for maintenance of the ROW is approximately $3,000 to $5,000 per mile. Based on an overall average cost of about $4,000 per mile, the expected annual maintenance cost for the utility corridor would be about $156,000 (Table 3-32).

TABLE 3-32
BASELINE ECONOMIC CONDITION OF PLANNING AREA UTILITY CORRIDOR MAINTENANCE

Baseline Economic Condition—45.5 Miles of Utility Corridor Maintenance			
Category	Direct	Indirect & Induced	Cumulative
Dollar Value	$471,000	$272,795	$743,795
Employment	4.21	2.47	6.68
Labor Income	$190,845	$92,508	$283,353
Property Income	$24,835	$41,477	$66,312
Tax Revenue	$6,423	$16,651	$23,074
Value Added	$222,102	$150,637	$372,739

Source: CIC Research, Inc. and MIG IMPLAN/Pro (base year 2006).

Maintenance activities for the utility corridors located within the Planning Area require about $471,000 in annual direct output within the EIA. The $471,000 in annual direct sales generated a cumulative total impact (direct, indirect, and induced) of about $743,000 in output, including nearly $373,000 in total value added. The total value added within the EIA included about $283,000 in labor income, about $66,000 in property income, more than $23,000 in tax revenue, and would generate about 6.7 jobs.

3.18.5.5.1.2 Communication Sites

There are four communication sites within the Planning Area. Two of the communication sites are small BLM-operated sites (Cahuilla Ranger Station and Dune Buggy Flats) that provide communication for BLM staff throughout the Planning Area. The two remaining communication sites are privately leased sites located at Osborne Overlook and Dunes Vista. Primary users of the Osborne Overlook and Dunes Vista communication sites include other federal government agencies (e.g., USBP and the military). Commercial entities also use a portion of the sites for cellular usage, and radio and TV signals. Some city and county governments also have facilities to support their communication needs. Over a five-year period (FY2004-FY2008),

BLM-operated communication sites require roughly $500 per year per facility to operate. The two non-BLM communication sites require about $10,000 per year per facility for maintenance and equipment. Thus, the four existing facilities require approximately $21,000 in maintenance expenditures on an annual basis. The annual economic value generated by BLM communication facilities represents a very small portion of the Planning Area EIA economy. Using the IMPLAN model for the Planning Area, the baseline economic condition of the annual maintenance and operations for the existing communication facilities are as follows in Table 3-33.

TABLE 3-33
BASELINE ECONOMIC CONDITION OF COMMUNICATION SITES AND FACILITIES ON BLM LAND WITHIN THE PLANNING AREA

Baseline Economic Condition—Four Communication Facilities			
Category	Direct	Indirect & Induced	Cumulative
Dollar Value	$ 21,000	$ 12,163	$ 33,163
Employment	0.19	0.11	0.30
Labor Income	$ 8,509	$ 4,125	$ 12,634
Property Income	$ 1,107	$ 1,849	$ 2,957
Tax Revenue	$ 286	$ 742	$ 1,029
Value Added	$ 9,903	$ 6,716	$ 16,619

Source: CIC Research, Inc. and MIG IMPLAN/Pro (base year 2006).

The four communications sites located within the Planning Area require about $21,000 direct output within the EIA for annual maintenance. The $21,000 in annual direct sales generated a total cumulative impact (direct, indirect, and induced) of about $33,000 in output, including an estimated $16,600 in total value added. The total value added within the Planning Area included $12,600 in labor income, about $3,000 in property income, more than $1,000 in tax revenue, and would generate about one-third of a job (0.30). The annual economic value generated by annual maintenance of communication sites within the Planning Area is an insignificant portion of the $23.1 billion total output within the EIA economy.

3.18.5.5.1.3 Apiary Permits

Temporary use permits for apiary sites are issued seasonally along the Coachella Canal. These permits generate revenue of about $0.30 per hive. There are two active apiary permits for a maximum authorized 3,500 hives. These permits are issued on a combined total of eight acres within the Planning Area. Estimated output value per hive is $65. The total maximum estimated output for 3,500 hives would be $227,500 (Table 3-34).

TABLE 3-34
BASELINE ECONOMIC CONDITION FOR APIARY ACTIVITY WITHIN THE PLANNING AREA

Economic Impacts of Baseline Condition—3,500 Hives			
Category	Direct	Indirect & Induced	Cumulative
Dollar Value	$227,500	$133,298	$360,798
Employment	2.42	1.14	3.56
Labor Income	$68,893	$41,433	$110,326
Property Income	$41,807	$24,008	$65,814
Tax Revenue	$6,089	$6,650	$12,740
Value Added	$116,789	$72,091	$188,880

Source: CIC Research, Inc. and MIG IMPLAN/Pro (base year 2006).

Apiary activities located within the Planning Area produce a maximum of about $227,500 in annual direct output within the EIA. The $227,500 in annual direct sales generated a cumulative total impact (direct, indirect, and induced) of about $361,000 in output, including $189,000 in total value added. The total value added within the EIA included about $110,000 in labor income, about $66,000 in property income, nearly $13,000 in tax revenue, and would generate the equivalent of about four jobs annually (3.56). The annual economic value generated by annual apiary production activities within the Planning Area is an insignificant portion of the $23.1 billion total output within the EIA economy.

3.18.5.5.1.4 Renewable Energy

Renewable energy ROWs on BLM lands are generally issued for solar or wind energy sites, but also include biomass. There are wind and solar resources that have been identified with commercial production potential in the Planning Area. At this time, there is no commercial production of solar energy or wind energy on BLM-administered lands within the Planning Area. Lands available for solar energy development within the Planning Area are identified on Maps 2-29 through 2-32 and encompass a total of 188,833 surface acres. Lands available for wind energy development within the Planning Area are identified on Maps 2-33 through 2-36 and encompass a total of 188,833 surface acres.

Proximity to major electrical distribution systems is a specific requirement for financial feasibility and is dependent on the SEMPRA Energy transmission corridor. If and when a project is proposed to the BLM, the BLM and operator(s) would need to prepare project-specific PODs. Each POD would need to address the potential impacts (including economic and social impacts) of proposed solar or wind energy site leases and development.

Feasible development of solar energy resources within the Planning Area would likely use concentrating solar power (CSP). CSP generation uses several arrays of mirrors to

reflect sunlight and concentrate it on an absorber containing a fluid or thermal mass. The heated fluid or mass is then used to boil water into steam, which drives a turbine and then a generator. There are three leading forms of CSP. The first places parabolic trough shaped mirrors (a U-shaped arrangement) with a tube containing synthetic oil running along its focal point, and the oil can be heated to 400 degrees centigrade. The second uses a parabolic dish mirror on which a collector is placed at its focal point. In this configuration, a Stirling engine is the collector, and the heat is converted into electricity at each dish. The third approach utilizes a central tower with mirrors arranged radially around it. The mirrors direct sunlight to a thermal mass (e.g., molten nitrate salts) that reaches temperatures of 600 degrees centigrade. The NREL estimates capital costs of $2M to $5M per MW to construct a plant. CSPs enjoy low operating and maintenance costs compared to fossil fuel plants. Currently, the price per kilowatt-hour for CSP varies between 13 and 18 cents (Leitner 2002).

3.18.5.5.1.5 Filming on Public Lands

A permit is required for all commercial filming activities on public lands. Commercial filming is defined as the use of motion picture, videotaping, sound recording, or other moving image or audio recording equipment on public lands that involves the advertisement of a product or service, the creation of a product for sale, or the use of actors, models, sets, or props, but not including activities associated with broadcasts for news programs. Public land visitors and recreational, professional, and amateur photographers do not need a permit to take still photographs unless the still photography will: use models, sets, or props that are not part of the site's natural or cultural resources or administrative facilities; take place where members of the public are generally not allowed; or will take place at a location where additional administrative costs are likely.

Special permits to use the public lands for commercial film production are issued by the BLM under section 302(b) of FLPMA. Regulations governing filming on public lands are covered in 43 CFR 2920, leases permits, and easements. During the four-year period of 2005 through 2008 there were a total of 56 filming permits issued (excluding cancelled permits). More than one-third (36 percent) of the permits were issued for still photography and were mainly in support of commercial print ads. The second largest category was student filming permits, which represented about 18 percent of the permits issued. The balance of the permits included documentaries, commercials, TV episodes, and features. Some of the photo shoots and filming activities required up to 80 people (actors and crew) onsite.

The film permit data indicated an average of 14 permits per year, with a total film/photo crew of 230 people. Based on the California Film Commission production cost guidelines the average annual total expense for these film permit activities was about $315,000 of which about $110,000 was spent in the Planning Area EIA. The $110,000 in annual direct impact generated a total cumulative impact (direct, indirect, and induced) of about $175,000 in output, including an estimated $102,000 in total value added. The total

value added within the EIA included about $72,000 in labor income, about $20,000 in property income, about $9,000 in tax revenue, and would generate about 3 jobs (3.2) in annual employment. The annual economic value generated by commercial filming and photography activities within the Planning Area is an insignificant portion of the EIA economy (Table 3-35).

TABLE 3-35
BASELINE ECONOMIC CONDITION FOR FILMING WITHIN THE PLANNING AREA

Baseline Economic Condition—14 Filming Permits per Year			
Category	Direct	Indirect & Induced	Cumulative
Dollar Value	$110,250	$64,308	$174,558
Employment	2.60	0.60	3.20
Labor Income	$49,594	$22,774	$72,368
Property Income	$9,351	$11,104	$20,455
Tax Revenue	$5,501	$3,370	$8,872
Value Added	$64,446	$37,249	$101,695

Source: CIC Research, Inc. and MIG IMPLAN/Pro (base year 2006).

3.18.5.5.2 Program-specific Sociocultural Conditions

The Planning Area is a primary OHV recreational resource for an increasing number of people living in the region. While OHV recreationists come from all walks of life and socioeconomic statuses, they are primarily middle income. In their occupations, politics, religions, and residential patterns, they may have little in common; with regard to sand dunes recreation, they share a great deal. Some call themselves Duners and refer to their sport as duning (Brunasso 2009a). Actually riding or driving in the sand dunes is only one of the aspects that draw people to the Planning Area. Other attractions include camping with family and friends, experiencing the sand dune environment, and exploring the sand dunes. The primary lands and realty concern for the Duners is access to the sand dunes for recreational activities. Miscellaneous ROWs, utility ROWs, land tenure, communication sites, and land use permits and other withdrawals are generally not applicable to the sand dune environment or of little interest. However, because of the OHV community's strong concern about further withdrawals from sand dune recreation areas, many may be resistant to withdrawals elsewhere.

Other major visitor groups to the Planning Area include Native Americans and environmentalists. Both of these groups tend to believe that a larger fraction of the Planning Area, or all of it, should be left alone and/or restored to its natural state. The Quechan tribe, whose traditional lands were contiguous with the sand dunes, seems to come to that position from their traditional belief in stewardship of the land and their

spiritual relationship to the land. Environmentalists seem to have arrived at a belief in preservation from a natural science perspective.

3.18.5.6 Summary of Resource Programs

3.18.5.6.1 Baseline Economic Conditions

Measurable economic activity was identified for three BLM resource programs within the Planning Area: recreation management, transportation and public access, and lands and realty management. The total annual direct economic output activity for these BLM resource programs was about $112 million annually (Table 3-36). The total cumulative economic output (direct, indirect, and induced) was an estimated $171 million per year. The $171 million in cumulative total output included an estimated $109 million in total value added within the Planning Area, including more than $67 million in labor income (wages and salaries), and generated a total of 2,139 jobs. The annual economic value supported by BLM-administered Planning Area land represented a little less than one percent of the total regional output of the three-county Planning Area EIA.

TABLE 3-36
SUMMARY OF THE BASELINE ECONOMIC CONDITION:
PLANNING AREA TOTAL CUMULATIVE IMPACT

Baseline Economic Condition—Summary of Planning Area Land Uses			
Category	Direct	Indirect & Induced	Cumulative
Dollar Value	$113,419,712	$ 59,001,666	$172,421,378
Employment	1,636	521	2,139
Labor Income	$ 47,942,825	$ 20,212,799	$ 68,155,624
Property Income	$ 13,072,563	$ 10,652,209	$ 23,724,722
Tax Revenue	$ 14,873,195	$ 3,305,764	$ 18,122,099
Value Added	$ 75,888,635	$ 34,170,791	$109,182,525

Source: CIC Research, Inc. and MIG IMPLAN/Pro (base year 2006).

3.18.5.6.2 Program-specific Sociocultural Conditions

The Planning Area is used primarily by six types of stakeholders. In order of their numbers, they are:

- The OHV community
- The environmental community (e.g., hikers, birdwatchers)
- On-site vendors
- Business owners in nearby communities

- Community representatives
- Quechan Tribe

OHV enthusiasts stress the value of their recreation experience and socio-cultural significance of the OHV lifestyle. Some call themselves Duners (Brunasso 2009a). OHV enthusiasts mention that riding and/or driving dune vehicles is not the only dune attraction. They express that camping, fellowship, and being in the dune environment are important recreational factors. Their primary recreation management concern is continued access to the sand dunes. However, many have expressed concerns with safety, alcohol and drug abuse, and disruptive behavior within the Planning Area (Brunasso 2009b).

Environmentalists are defined more by their interests and values than by their participation in particular activities. The activities that environmentalists participate in include camping, hiking, and observing nature. They typically mention being attracted to the sand dune recreational experience by the solitude, quiet, the unique plants of the dunes, and the beautiful dune landscape. Their primary expressed concerns have to do with threats to the natural dune landscape and the native plants and animals. They typically perceive OHV activities as a threat to the natural dunescape and generally support the notion of more WA and less open area for OHVs.

On-site vendors express a variety of concerns regarding BLM rules, particularly the rule that makes them break camp and move out every week. They suggest that they should be allowed to set up and live within the Planning Area during the OHV season. This would help them provide better services and a wider range of products to the OHV community.

OHV-related business owners in nearby communities strongly support the OHV activities within the Planning Area and oppose restrictions on the use of the dunes. They strongly support the OHV community. Some community-based businesses are in competition with the vendors within the Planning Area and would like to see more restrictions on them. Community-based business owners feel they are in unfair competition with the on-site vendors.

The Quechan Tribe has strong cultural and spiritual ties to the sand dunes. They are reasonably happy with the balance between preservation and open OHV areas. However, they are concerned about the plants and animals of the dunescape and the safety of the OHV recreationists.

All Planning Area user communities are becoming increasingly familiar with the management of these resources, and increasingly aware of the existence and views of other user types. There is more of a discussion among user types and less diatribe than in previous years.

3.19 Environmental Justice

Beginning in the 1990s, the concept of environmental justice came to widespread public attention. Concern has developed over environmental justice issues among advocates for low-income and minority communities. In general terms, the focus of environmental justice is on disproportionate adverse environmental impacts on low-income communities and minority communities in the US. These impacts and the nature of disadvantaged communities are difficult to measure. However, a number of EOs and policy initiatives have attempted to address environmental justice concerns.

EO 12898 is entitled *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations*. The executive order was issued by President Clinton on February 11, 1994. The order requires federal agencies to identify minority and low-income populations, and ascertain whether or not disproportionately high and adverse health or environmental effects might result from their programs, policies, and activities. Subsequently, the EPA defined environmental justice as fair treatment and meaningful involvement of all people regardless of their race, color, national origin, or income in the development, implementation, and enforcement of environmental laws, regulations, and policies. The Office of Environmental Justice coordinates the EPA's efforts to integrate environmental justice into all policies, programs, and activities. The EPA also established the National Environmental Justice Advisory Council to incorporate environmental justice into federal environmental health research, environmental law enforcement, environmental penalty assessment, environmental rulemaking, and facility location decisions.

EO 13045 is entitled *Protection of Children from Environmental Health Risks.* It requires that federal agencies assess the environmental, health, and safety risks that may disproportionately affect children. Thus, disproportional impacts to children are now considered under environmental justice.

According to the CEQ environmental justice guidelines, minority populations should be identified when the minority population percentage either exceeds 50 percent or the minority population is meaningfully greater than the minority population in the general population or in a meaningful geographic area. While we lack specific demographic data on the ethnicity of visitors to the Planning Area, field observations suggest they are overwhelmingly White. This is in contrast to the population of surrounding Imperial County, which, in the 2000 census, had approximately 27 percent Whites and 70 percent Hispanics. Similarly, ethnicity data are not available for the environmental community, but field observations suggest it also appears to be overwhelmingly White in southern California. The primary management issue within the Planning Area is how to strike a balance between environmental concerns and OHV access/recreation. Expansion of WAs is generally supported by environmentalists and the opposite, expansion of open OHV areas, is supported by the OHV community.

The Quechan Tribe is a minority ethnicity with interests in the Planning Area. Previous fieldwork suggests that they are reasonably happy with the present balance between preservation and OHV access/recreational use (Russell et al. 2002).

3.19.1 Minority and Low-income Communities

As presented in the discussion of environmental justice above, the BLM is aware that there are small pockets of poverty and/or minority populations scattered throughout the region of the Planning Area. However, the BLM has not identified any communities within the Planning Area with low income or minority populations that are disproportionately impacted by the existing land use activities and policies for BLM-administered lands.

THIS PAGE IS INTENTIONALLY BLANK.

CHAPTER 4.0
Environmental Consequences

4.1 Introduction

This chapter assesses environmental impacts due to the implementation of the alternatives described in Chapter 2. The baseline affected environment, or existing condition, is described in Chapter 3.

4.1.1 Analytical Assumptions

The following impacts analysis was conducted with the following assumptions:

- Any requirement for the obligation of funds for projects in this DRAMP shall be subject to the availability of funds appropriated by Congress, and none of the proposed management actions shall be interpreted to require obligation or payment of funds in violation of any applicable federal law, including the Anti-Deficiency Act, 31 USC § 1341, et seq.

- The laws, regulations, and policies that direct BLM management would be applied consistently for all alternatives.

- Short-term impacts are those expected to occur within one to five years after implementation of a management action or BMP. Long-term impacts are those that would occur after the first five years of implementation.

4.1.2 Types of Effects

The potential impacts from those actions that would have direct, indirect, and cumulative effects were considered for each resource. Effects and impacts as used in this document are synonymous and could be beneficial or adverse.

Direct effects are caused by the action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later in time or further in distance, but are still reasonably foreseeable. Cumulative impacts are those effects resulting from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions (regardless of which agency or person undertakes such actions). Cumulative impacts could result from individually insignificant but collectively significant actions taking place over a period of time.

Section 1502.16 of the CEQ regulations forms the scientific and analytic basis for the comparisons of alternatives as described under Section 1502.14—Alternatives including the Proposed Action. The environmental consequences section consolidates the discussions of those elements required by sections 102(2)(C)(i), (ii), (iv), and (v) of NEPA which are within the scope of this EIS and as much of Section 102(2)(C)(iii) as is necessary to support the comparisons. The discussion will include the environmental impacts of the alternatives, including any adverse environmental effects which cannot be avoided, the relationship between short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved in the proposal should it be implemented.

4.1.3 Summary of Critical Elements Addressed, Not Addressed, Not Affected, or Not Present

Critical elements identified in the BLM NEPA Handbook as amended by IM 99-178 addressed in this chapter include air quality, ACECs, cultural resources, environmental justice, Native American religious concerns, threatened or endangered species, hazardous and solid wastes, drinking, ground or surface water quality, recreation, wilderness, and invasive and nonnative species.

Critical elements not addressed and/or not present include farm lands (prime or unique), grazing, wetlands/riparian areas, floodplains, and wild and scenic rivers.

4.1.4 Potential Impacts to Resources by Alternative

Impacts to resources would vary by alternative as the amount of surface disturbance in alternatives varies. Alternatives providing more acreage for OHV recreation, camping, construction activities, as well as geothermal leasing and renewable energy (solar and wind) activities would likely result in greater adverse impacts to resources. Table 4-1 below presents the acres available for geothermal leasing, OHV recreation, and renewable energy development (solar and wind energy) by alternative. This table will be used to analyze impacts to various resources by alternative.

TABLE 4-1
POTENTIAL IMPACTS TO RESOURCES BY ALTERNATIVE (ACRES)

Designation	Alternative							
	1	2	3	4	5	6	7	8
Mineral Resources—Land Available for Geothermal Leasing (acres)								
Available	188,426	188,426	0	0	11,939	11,939	188,426	35,115
Not Available	0	0	188,426	0	0	0	0	136,691
Available, but with an NSO stipulation	0	0	0	188,426	0	0	0	14,025
Recreation—OHV Open, Closed, and Limited (acres)								
Open	120,393	87,713	74,676	105,843	103,839	108,914	125,710	127,416
Closed	26,098	75,322	87,778	55,220	58,614	53,539	36,743	35,144
Limited	68,440	51,896	52,477	53,868	52,477	52,477	52,477	52,370
Lands and Realty—Renewable Energy (Solar and Wind) (acres)								
Available	188,833	188,833	47,131	39,694	39,694	39,694	188,833	35,115
Avoidance	0	0	0	144,290	144,290	144,290	0	0
Excluded	0	0	141,702	4,847	4,847	4,847	0	153,717

4.2 Impacts on Air and Atmospheric Values

Certain activities associated with each of the alternatives would result in the emissions of air pollutants in varying amounts. Air emissions generally can be divided into two categories: emissions of criteria pollutants and greenhouse gas emissions. Criteria air pollutants are those that have the potential to affect human health directly. GHG emissions are those that potentially affect global climate. This section assesses the potential air quality emissions (both criteria pollutants and GHG emissions) that may result under each of the alternatives.

4.2.1 Analysis Assumptions

Climate change analyses consider the effects of several factors including GHG emissions, land use management practices, and the albedo effect, among others. The tools necessary to quantify climatic impacts from a particular source of GHG emissions are presently unavailable. As a consequence, impact assessment of specific effects resulting from anthropogenic activities cannot be performed. Therefore, climate change analysis for the purpose of this document is limited to the accounting and disclosing of factors that contribute to climate change, such as GHG emissions. Qualitative and/or quantitative evaluation of potential contributing factors within the Planning Area is included where appropriate and practicable.

The potential direct, indirect, and cumulative effects of the alternatives on the factors that contribute to climate change (GHG emissions) will be analyzed in this document. Some of the GHG emissions associated with each alternative and its activities would be naturally sequestered, while the balance of those emissions would accumulate in the atmosphere. The accumulation of GHG emissions in the atmosphere could contribute to further manifestations of climate change.

4.2.2 Air Quality (Criteria Pollutant Emissions)

The potential impacts to air quality could result from OHV recreation, vehicle emissions, dust, construction and maintenance activities, and mineral extraction activities.

The ICAPCD considers recreational use of public lands to be exempt from their regulations for fine particulate matter under Rule 800, when the use of such lands is covered by the most recent BLM dust control plan in compliance with Rule 800. Recreational use of the Planning Area is exempt from the requirements of ICAPCD Rule 800, as it is under a BLM dust control plan. The ECFO has developed a *Fugitive Dust Control Plan* to identify sources of PM_{10} within lands administered by BLM and identify dust control measures that can be implemented to help minimize or eliminate emissions (BLM 2006a). A revised plan will be developed by BLM and submitted to Imperial County.

A federal action is subject to a full conformity analysis when the total of direct and indirect emissions associated with the action equal or exceed emission rates set forth in 40 CFR Part 93. The threshold (*de minimis*) levels for requiring a full conformity analysis and the amount of emissions that could result in significant impacts are based on the attainment status of each criteria pollutant in the project air basin. These are presented in Table 4-2 below for the SSAB in which the Planning Area is located.

TABLE 4-2
FEDERAL *DE MINIMIS* THRESHOLDS FOR THE SALTON SEA AIR BASIN

Salton Sea Air Basin		
Pollutant	Federal Designation	Threshold (tons/year)
Ozone* (VOCs)	Non-Attainment, Moderate	100
Ozone* (NOx)	Non-Attainment, Moderate	100
PM_{10}	Non-Attainment, Moderate	100
$PM_{2.5}$	Attainment	N/A
CO	Attainment	N/A

Source of thresholds: 40 CFR 93
*Emission thresholds are given for ozone precursor elements, VOCs and NOx, based on the attainment status of ozone.
N/A: not applicable

These threshold levels are used to determine the potential significance of activities on BLM-administered lands in the Planning Area.

The predominant source of air pollutants is OHV activity associated with recreational use of the dunes. The air emissions from these recreation vehicle sources were modeled, and the estimated annual criteria air emissions are summarized in Table 4-3 for each alternative. For comparison, the *de minimis* thresholds for the SSAB are also shown in Table 4-3.

TABLE 4-3
ESTIMATED ANNUAL AIR QUALITY EMISSIONS DUE TO OHV ACTIVITY (TONS/YEAR)

	VOCs	NOx	CO	PM_{10}	$PM_{2.5}$
Baseline (Alternative 2, No Action) OHV emissions (motorcycles, ATVs, 4-wheel drive truck and sand rails) tons/year	796	177	6,543	83,095	16,236
Alternative 1 OHV emissions	1,210	269	9,941	12,236	24,666
Alternative 1 incremental change relative to baseline (No Action)	**413**	92	3,397	**43,141**	8,430
Alternative 3 OHV emissions	528	117	4,339	55,097	10,766
Alternative 3 incremental change relative to baseline (No Action)	-268	-60	-2,205	-27,998	-5,471
Alternative 4 OHV emissions	1,091	242	8,968	113,879	22,252
Alternative 4 incremental change relative to baseline (No Action)	**295**	66	2,425	**30,784**	6,015
Alternative 5 OHV emissions	1,039	231	8,539	108,435	21,188
Alternative 5 incremental change relative to baseline (No Action)	**243**	54	1,995	**25,340**	4,951
Alternative 6 OHV emissions	1,078	239	8,858	112,481	21,978
Alternative 6 incremental change relative to baseline (No Action)	**282**	63	2,134	**29,386**	5,742
Alternative 7 OHV emissions	1,192	265	9,796	124,398	24,307
Alternative 7 incremental change relative to baseline (No Action)	**396**	88	3,252	**41,303**	8,071
Alternative 8 OHV emissions	1,149	255	9,439	119,863	23,421
Alternative 8 incremental change relative to baseline (No Action)	**352**	78	2,895	**36,768**	7,184
Federal SSAB *de Minimis* Thresholds (tons/year)	100	100	N/A	100	N/A

Bold indicates an increase exceeding the *de minimis* threshold
VOCs = volatile organic compound
NOx = oxides of nitrogen
PM_{10} = particulate matter (less than 10 microns)
$PM_{2.5}$ = particulate matter (less than 2.5 microns)
CO = carbon monoxide

Estimated recreational vehicle use of the Planning Area by alternative was obtained from Section 4.18.2—Social and Economic Impacts of Recreation Activities and background parameters (CIC Research 2009), as well as the 2006 visitor profile (Haas and Collins 2008). Based on activity data in the 2006 visitor profile, visitors typically spend an average of 5.6 hours per day in the dunes off-roading, and the average length of stay was 3.1 days. OHV recreational emissions were calculated using the NONROAD model for ATVs, motorcycles, and sand rails (EPA 2006), and the URBEMIS 2007 model for 4-wheel drive trucks (Rimpo and Associates 2008). The results are presented in Table 4-3.

Fugitive dust emissions for ATVs and motorcycles were estimated using emissions rates from the South Coast Air Quality Management District (1993), and fugitive dust emissions for 4-wheel drive trucks and sand rails were modeled by selecting travel on unpaved roads in the URBEMIS model. The NONROAD model options were used to generate emissions from each vehicle based on hours per day of use. An average vehicle speed of 15 miles per hour was selected in the URBEMIS model; this average speed over the 5.6-hour active period per day was used to obtain the average daily vehicle miles traveled, which was the basis for the amount of activity modeled with URBEMIS. Emissions were calculated for the baseline and were rationed to obtain emissions for the other alternatives based on the differences in base vehicles described in Section 4.18. Baseline emissions are taken to be those under Alternative 2. These emissions are compared to those of the other alternatives to estimate the incremental change in emissions resulting from the decisions in this plan.

Motorcycles and ATV emissions due to operation within the Planning Area were considered to be exhaust emissions and fugitive dust. Emissions in the NONROAD model associated with hose and tank permeation were not included, as these are not isolated to the period of use in the Planning Area. Sand rails were modeled in URBEMIS as non-catalyst (no catalytic converter) automobiles.

Lesser emission-generating activities on BLM-administered lands in the Planning Area include: generator usage; campfires; facility maintenance and construction associated with any future concessions; and non-OHV travel on BLM roads in the Planning Area.

As seen in Table 4-3, the incremental estimated change in emissions generated in the Planning Area under Alternative 3 is less than the *de minimis* threshold and thus exempt from the conformity determination requirements of the EPA's conformity rule. If this alternative is selected, a record of non-applicability (RONA) shall be prepared and included as an appendix.

The incremental estimated change in emissions generated in the Planning Area under Alternatives 1 and 4 through 8 exceed the *de minimis* thresholds. Therefore, if one of these alternatives is selected, a Conformity Determination must be made as to whether the selected alternative conforms to the ICAPCD's SIP for ozone and PM_{10}.

Discretionary construction activities would incorporate BMP to control dust, as described in Appendix C.

4.2.3 Odors

There are no odor sources in the Planning Area in proximity to sensitive receptors. Campground toilets exist, but are maintained to reduce odors and are located in rural areas.

4.2.4 Climate Change

This section discusses the potential impacts of the alternatives on factors that may contribute to climate change (GHG emissions). Analytical assumptions are described in Section 4.2.1 above.

OHV recreation and other driving activity would generate GHG emissions. The primary GHG for these activities is CO_2. The incremental change in GHG emissions from the baseline due to OHV activity in the Planning Area is summarized in Table 4-4. Other GHG emission-generating activities on BLM-administered lands in the Planning Area include: generator usage; campfires; sand and gravel mining; locatables mining, including gold and silver; and facility maintenance and construction associated with any future concessions.

TABLE 4-4
ESTIMATED INCREMENTAL CHANGE IN CO_2 EMISSIONS DUE TO OHV ACTIVITY (TONS/YEAR)

	CO_2
Alternative 1 change in OHV emissions (tons/year)	37,074
Baseline (Alternative 2) change in OHV emissions (tons/year)	0
Alternative 3 change in OHV emissions (tons/year)	-24,060
Alternative 4 change in OHV emissions (tons/year)	26,455
Alternative 5 change in OHV emissions (tons/year)	21,776
Alternative 6 change in OHV emissions (tons/year)	25,253
Alternative 7 change in OHV emissions (tons/year)	35,494
Alternative 8 change in OHV emissions (tons/year)	31,597

CO_2 = carbon dioxide

Although the potential effects described above relate to climate resources and GHG emissions, no direct effects of these emissions to localized climate and weather can be identified.

4.2.5 Differences between Alternatives

As detailed above, emissions generated in the Planning Area would be unchanged for Alternative 2 (No Action), less than the baseline condition under Alternative 3, and greater than the baseline condition for Alternatives 1 and 4 through 8.

Under Alternative 3, there would be the potential for campgrounds in the Dunebuggy Flats and Gecko areas to be closed. Under Alternative 8, the Dunebuggy Flats Campground would be closed if the rainfall threshold for PMV is met. Such campground closures may result in increased camping in other areas in the vicinity such as Ogilby and Dunes Vista. The Dunes Vista camping area is a significant distance from the actual sand dunes and could generate more dust from OHVs traveling from the camp to the dunes. Riding in the valley floor areas generates more dust than riding on the dunes.

4.2.6 Unavoidable Adverse Impacts

Unavoidable adverse impacts to air quality on BLM-administered lands may occur from sources not under BLM management such as: vehicle emissions from county and state roads (I-8, SR-78, and unassociated traffic on Ted Kipf and Niland–Glamis roads), emissions from heavy truck traffic accessing the Mesquite Regional Landfill, emissions from the UPRR, county and state road maintenance, military and other aircraft, agriculture, and dust generated by natural wind and high wind events.

Emissions generated from law enforcement or emergency search and rescue activities, including USBP activities, could potentially result in or contribute to adverse impacts to air quality on BLM-administered lands, which would be an unavoidable adverse impact.

4.2.7 Cumulative Impacts

Projects in the Planning Area that could contribute to cumulative effects include: existing permitted sand and gravel operations; the All-American Canal Lining Project; and the BOR Drop-2 Reservoir Project.

There is potential for an incremental increase of GHG emissions resulting from uses allowed by the management actions, which could contribute to cumulative regional and global GHG emissions.

4.3 Impacts on Soil Resources

Soils within the Planning Area, which consist primarily of sands, are susceptible to impacts from compaction and erosion. Both beneficial and adverse impacts to these soil resources could occur from land use authorizations (including ROWs, leases, and

development), mineral/mining development, and OHV recreation. Soils within the Planning Area would be susceptible to impacts from compaction, disturbance, and invasion by non-native plant species.

Under all alternatives, impacts would be avoided or minimized to the maximum extent possible by management actions and BMP.

4.3.1 Impacts Resulting in Compaction and Erosion

Compaction has the potential to occur from camping, OHV recreation, and construction activities (e.g., ROW facilities and new access roads, recreational facilities, mining activities, and wildlife waters). While compaction would not be a high risk in the deep sand environment, some of the soils in the microphyll woodland and creosote scrub communities could be more susceptible to compaction. Concentrated visitor use, designated camping, and high-use OHV areas would result in increased soil compaction, which in turn could limit soil productivity.

Erosion has the potential to occur from motorized use of unpaved routes and dunes. Construction activities (e.g., facilities and new access roads, recreational facilities, and mining activities) usually result in removal of vegetation, increasing erosion potential.

Geothermal energy development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Impacts to soil resources from geothermal energy development could include both compaction and erosion.

The effect of OHV recreation on sand dunes in the Planning Area has been discussed by Norris (1995) and is characterized primarily by increased erosion and the creation of vehicle tracks. Although the visual effects of the OHV tracks may dissipate after a windstorm, the vehicle impacts on erosion of the mobile sand dunes have a longer lasting effect. The loss of vegetation due to OHV trampling and erosion from vehicle tracks result in reduced habitat availability for wildlife and insect species. These lasting impacts could be repaired naturally over the span of several years, if no further vehicle activities occur in the impacted area.

Unvegetated or sparsely vegetated dunes are for the most part active, dynamic systems that would fairly promptly re-establish their pristine form if left relatively undisturbed and if the sources of sand were not adversely affected in some way. Relict or vegetated dunes would take longer to recover their original character than mobile, active dunes.

Better developed soils and stable surfaces within the Planning Area, particularly those of the distal portions of the alluvial fans extending into the Planning Area from the east, would take longer to regain their natural aspect than dunes soils. In these areas of more stable surfaces, soil compaction would also be an effect of OHV recreation. Evidence would suggest that some of these gravelly, stable surfaces might not regain their predisturbance character for centuries (Steiger and Webb 2000).

Utility-scale solar energy development can include commitment of a large land area for both photovoltaic (PV) and concentrating solar power (CSP) systems. This land area would be used for the solar systems themselves (whether PV or CSP), as well as ancillary buildings, water storage and discharge facilities, fencing, access roads, and off-site facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), as well as ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Impacts to soil resources from solar and wind energy development could include both compaction and erosion.

4.3.2 Differences between Alternatives

Impacts to soil resources from geothermal leasing under mineral resources would vary by alternative. Geothermal leasing would adversely impact the least amount of soil resources under Alternatives 3 and 4. Under Alternative 3, no acres within the planning area would be available for geothermal leasing and under Alternative 4, 188,426 acres would be available but with a No Surface Occupancy stipulation. Under Alternatives 1, 2, and 7, 188,426 acres would be available for geothermal leasing, resulting in greater potential adverse impacts to soil resources. Under these alternatives, there would be increased acreages of lost soil productivity within the Planning Area (see Table 4-1). Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing, resulting in low to moderate potential adverse impacts to soil resources as compared to Alternatives 1, 2, and 7. Under Alternative 8, moderate adverse impacts to soil resource would likely occur as 35,115 acres would be available for geothermal leasing.

OHV area designations would adversely impact soils the least under Alternatives 2 and 3. Under these alternatives, the fewest number of acres open to OHV recreation (87,713 and 74,676 respectively) and highest number of closed acres (75,322 and 87,778 respectively) occur. Motorized travel would not be authorized within proposed closed

OHV management areas, and additional soil erosion and compaction from OHV recreation would no longer occur. Under Alternatives 4, 5, and 6, adverse impacts to soil resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8. Under Alternatives 1, 7, and 8 there would be increased acreages open to OHV recreation (120,393, 125,710, and 127,416 respectively) resulting in the most acres of potentially lost soil productivity within the Planning Area (see Table 4-1).

Adverse impacts to soil resources from solar and wind development would the lowest under Alternatives 3 and 8, which propose 47,131 and 35,115 acres, respectively, within the Planning Area available for solar and wind development. Under Alternatives 4, 5, and 6, adverse impacts to soil resources would be greater than under Alternatives 3 and 8 as these alternatives propose 39,694 acres available and 144,290 acres as avoidance for solar and wind development. An avoidance area is defined as an area only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization. Under Alternatives 1, 2, and 7, lands available for solar and wind development would increase (188,833 acres available) and, in turn, potential adverse impacts to soil resources would be greater. Under these alternatives, there would be increased acreages of lost soil productivity within the Planning Area (see Table 4-1).

4.3.3 Unavoidable Adverse Impacts

Law enforcement or emergency search and rescue activities, including USBP activities, and human entry of the area by undocumented immigrants could potentially result in soil compaction and erosion, which would be an unavoidable adverse impact.

Natural events such as high winds and thunderstorms would continue to erode soils, potentially leading to changes in structure and distribution of soils.

4.3.4 Cumulative Impacts

Cumulative impacts to soil resources within and surrounding the Planning Area could increase as a result of an increased demand for renewable energy, such as geothermal, solar and wind developments. The cumulative effects of energy development, transmission, and storage are likely to increase throughout the life of the plan. As the growing population of the West demands more energy, the BLM would continue to accommodate these needs where practicable. Public lands within the Planning Area as well as lands surrounding the Planning Area (public, private, and managed by state or jurisdictions) could be marked with increased infrastructure and maintenance roads, which would likely increase the proliferation of OHV travel. The cumulative effect of energy development would be significant because the impacts would be to large areas of land for long durations of time.

The development and public use of recreational sites in the Planning Area have compacted and denuded significant soil resources, causing long-term erosion, sedimentation, decreased vegetative diversity, and loss of habitat productivity. Open camping and firewood collection has led to diminished organic soil matter, decreased vegetative vigor, soil compaction in roads and campsites, and increased wind and water erosion rates.

Law enforcement or emergency search and rescue activities, including USBP activities, and human entry of the area by undocumented immigrants could potentially result in soil compaction and erosion, which would be a cumulative impact.

4.4 Impacts on Water Resources

The primary impacts to water resources in the Planning Area would be to ground water. Impacts on ground water are discussed in terms of water quality, (dissolved solids and chemical/inorganic and microorganism composition) and quantity.

The assessment of impacts assumes that implementation of the proposed alternatives would include measures required by federal, state, or local law and/or regulation, when applicable. The proposed alternatives would have an adverse impact on water resources if they:

- substantially degrade water quality
- contaminate a public water supply
- cause substantial flooding or siltation
- substantially alter surface flow conditions, patterns, or rates
- result in water demands that would outstrip supply

Maintenance and installation of restroom facilities and garbage receptacles would likely have beneficial long-term impacts on water resources by reducing the effects of visitor use on surface and groundwater quality.

Construction activities, mineral extraction activities, wildlife improvements, and recreational facility improvements that would rely on well water could increase the demands on groundwater.

Surface-disturbing activities within the watershed could impact the natural flows of washes or affect infiltration into the groundwater system. Restoration of disturbed sites may reduce the amount of siltation into the surface water as erosion may be reduced.

Shallow aquifers in the Planning Area could be impacted by construction activities associated with ROWs and other land use authorizations. These potential impacts include changes in overland flow and recharge caused by clearing and grading in construction areas (FERC and California State Lands Commission 2007).

The quality of groundwater could be affected by illegal dumping or accidental spills.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Impacts associated with geothermal development could include increased demands on groundwater or degradation of infiltration and natural flows due to siltation.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), as well as ancillary buildings, water storage and discharge facilities, fencing, access roads, and off-site facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). Impacts associated with solar energy development could include increased demands on groundwater or degradation of groundwater due to accidental spills.

4.4.1 Differences between Alternatives

Differences in impacts to ground water resources would potentially vary by alternative as the amount of surface disturbance varies. Alternatives providing more acreage for OHV recreation, camping, construction activities, as well as renewable energy and geothermal development activities would result in greater adverse impacts (see Table 4-1). Differences in impacts to ground water resources by alternative would be similar to those outlined in Section 4.3.2 for Soil Resources above.

4.4.2 Unavoidable Adverse Impacts

Law enforcement or emergency search and rescue activities, including USBP activities, could result in unavoidable adverse impacts to surface water quality where activities might require entry into riparian areas.

Human entry and use of the area by undocumented immigrants could result in unavoidable adverse impacts to surface water quality through litter deposition and entry.

Climate changes, including extended drought cycles, could potentially decrease the availability of surface and groundwater.

Unavoidable adverse impacts would potentially occur as a result of uncontrollable natural events (e.g., floods and storm events) in the Planning Area. Similar unavoidable impacts would potentially occur as a result of non-discretionary activities of cooperators on BLM-administered lands (e.g., train derailments).

4.4.3 Cumulative Impacts

Cumulative impacts to water resources resulting from increased recreational use, demand for natural resources, and other activities within and surrounding the Planning Area would continue and are likely to increase in the future. Because municipalities and water districts are the major water users within the region, there would be negligible differences in cumulative impacts to water resources from BLM actions proposed by alternative. Water resources on public lands may be affected by off-site use, recreation activities, development, and industrial (e.g., mining or landfill) uses regardless of the alternative selected.

The BOR is the federal agency charged with regulating the delivery of lower Colorado River (All-American and Coachella canals) water to farmers, municipalities, Mexico, and other water users. Reclamation projects, such as the Drop 2 Reservoir Project in Imperial County, California, could potentially reduce groundwater levels in the Planning Area. As population growth and water demands in the region continue to increase, cumulative impacts to water resources from similar types of activities within and adjacent to the Planning Area would likely increase.

4.5 Impacts on Vegetative Resources

Impacts could occur to terrestrial vegetation, priority plant species, and desired plant communities from the following: 1) direct loss of vegetative resource; 2) increase in non-native invasive species; and 3) change in cover species composition and structure, including density and vegetation.

The desired plant communities on BLM-administered lands within the Planning Area are creosote bush scrub, psammophytic scrub, and microphyll woodland. These habitat types would not be impacted by OHV recreation within the North Algodones Dunes Wilderness, which is closed to OHV recreation.

Some BLM land use plan decisions and authorized activities would be beneficial through vegetation protection and enhancement (e.g., habitat restoration), while others would be adverse by authorizing discretionary activities that could result in detrimental effects to vegetation.

Native terrestrial vegetation loss would be temporary or permanent based on the size and scale of the surface-disturbing activity and could include, but is not limited to, mineral resource activities (geothermal development), recreational use, construction of new recreational facilities, road building, renewable energy development (solar and wind), and construction/maintenance of ROWs.

Temporary losses are impacts from construction or other surface-disturbing activities that would recover post-activity. Permanent losses would include conversion of vegetation from construction of permanent facilities and structures. Vegetation loss would be minimal in the WA and ACECs, which are designated to protect sensitive resource values. Exclusion and avoidance areas would help to direct projects into areas that would have reduced impact on vegetation resources.

Impacts to native terrestrial vegetation could include both degradation and enhancement depending on the activities or decisions implemented. Degradation could be caused by activities that would change vegetative composition or structure. Enhancement could be caused by activities (e.g., vegetative management) that result in the restoration of a desirable native vegetative composition and improved seeding, germination, growth, and recruitment. Some of the vegetative management activities (e.g., non-native invasive plant species removal, mechanical vegetation removal) would result in temporary degradation to terrestrial vegetation, but the overall result would be enhancement of vegetative quality due to restoration of natural ecosystem function.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Geothermal energy development within the Planning Area could result in destruction of vegetation and vegetation communities, and introduction and spread of invasive plant species.

OHV recreation could result in destruction of vegetation along areas where vehicles are allowed to travel (open OHV management areas). OHV recreation could also cause soil compaction, which would reduce seeding and germination in these areas.

OHV recreation and other surface-disturbing activities could promote the spread of invasive plant species by denuding native plant cover and discouraging native plant development. Equipment used during construction activities could introduce non-native invasive species.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP) as well as ancillary buildings, water storage and discharge facilities, fencing, access roads, and off-site facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), as well as ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Solar and wind energy development within the Planning Area could result in destruction of vegetation and vegetation communities, and introduction and spread of invasive plant species.

4.5.1 Differences between Alternatives

Impacts to vegetation resources, including priority plant species, from geothermal development would vary by alternative. Geothermal development would adversely impact the fewest acres, and therefore vegetation resources, under Alternatives 3 and 4. Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing and under Alternative 8, 35,115 acres would be available for geothermal leasing. Under these alternatives, moderate adverse impacts to vegetation resources would occur as compared to Alternatives 3 and 4. Under Alternatives 1, 2, and 7, lands available for geothermal development would be the greatest (188,426 acres) and, in turn, potential adverse impacts to vegetation resources would be greater. Under these alternatives, there would be increased potential for the loss of vegetative resources due to geothermal construction and development activities within the Planning Area (see Table 4-1).

OHV area designations would adversely impact vegetation resources, including priority plant species, the least under Alternatives 2 and 3 (Table 4-5). The greatest number of

acres closed or limited to OHV recreation is found under these alternatives. Motorized travel would not be authorized within proposed closed OHV management areas, and vegetative loss from OHV recreation would no longer occur. Under Alternatives 4, 5, and 6, adverse impacts to vegetation resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8. Under Alternatives 1, 7, and 8 there would be increased acreages open to OHV recreation resulting in an increased number of acres of potentially lost or disturbed vegetation within the Planning Area (Table 4-5).

TABLE 4-5
VEGETATION COMMUNITIES WITHIN OPEN/CLOSED/LIMITED OHV RECREATION BY ALTERNATIVE (ACRES)

Vegetation Community	Alternative							
	1	2	3	4	5	6	7	8
Open OHV (acres)								
Creosote Bush Scrub	18,041	22,116	21,866	21,878	22,642	22,964	28,867	28,974
Psammophytic Scrub	84,592	51,727	41,076	70,891	67,501	70,020	77,439	79,038
Microphyll Woodland	13,603	9,827	7,577	8,816	9,539	11,772	15,247	15,246
Closed OHV (acres)								
Creosote Bush Scrub	4,515	11,806	11,517	11,504	10,741	10,418	4,515	4,515
Psammophytic Scrub	14,897	51,254	61,905	30,700	35,481	32,961	25,542	23,943
Microphyll Woodland	6,685	12,146	14,355	13,016	12,393	10,160	6,685	6,686
Limited OHV (acres)								
Creosote Bush Scrub	58,425	47,059	47,599	47,599	47,599	47,599	47,599	47,492
Psammophytic Scrub	6,758	3,266	3,266	4,656	3,266	3,266	3,266	3,266
Microphyll Woodland	1,703	18	60	60	60	60	60	60

Adverse impacts to vegetation resources, including priority plant species, from solar and wind leasing would be lowest under Alternatives 3 and 8. Under Alternatives 4, 5, and 6, adverse impacts to vegetation resources would be greater than under Alternatives 3 and 8 but less than under Alternatives 1, 2, and 7. Under Alternatives 4, 5, and 6 there would be 144,290 acres of land designated as avoidance areas. Under Alternatives 1, 2, and 7, lands available for solar and wind leasing would increase and, in turn, potential adverse impacts to vegetation resources would be greater. Under these alternatives, there would be increased acreages of construction and development for solar and wind sites within the Planning Area (see Table 4-1).

4.5.2 Unavoidable Adverse Impacts

Law enforcement or emergency search and rescue activities, including USBP activities, occurring in areas supporting priority plant species and desired plant communities could result in unavoidable adverse impacts to these resources. Human entry and use of the area by undocumented immigrants and OHV recreationists could result in unavoidable adverse impacts to vegetation resources through litter deposition and trampling of vegetation.

Climate changes, including extended drought cycles, could potentially decrease the availability of surface and groundwater; thereby affecting the health of the vegetation communities and priority plant species within the Planning Area.

4.5.3 Short-term Use and/or Long-term Productivity

Vegetated areas converted to permanent facilities or structures would result in a net loss of vegetation as long as those facilities or structures remain.

4.5.4 Cumulative Impacts

Vegetation resources on public lands may be affected by off-site use and development regardless of the DRAMP alternative selected. Impacts affecting soil resources would also affect vegetation resources within the Planning Area. Direct impacts of OHV recreation or cross-country travel have been well documented and include destruction of soil stabilizers, soil compaction, reduced rates of water infiltration, increased wind and water erosion, noise, decreased abundance of wildlife populations, and destruction of vegetation. Compaction of desert soil reduces the root growth of desert plants and makes it harder for seedlings to survive. Differences between alternatives may not be discernable for cumulative impacts to vegetative resources.

Excessive motorized travel over time causes a decrease in plant life not only from trampling but also from proliferation of dust particles. Dust that is accumulated on plants can cause transpiration failure and eventual death of the plants (Lovich and Bainbridge 1999). Effects to soils, over time, cause erosion of soils, loss of topsoil, and compaction of soils. These impacts bring changes in the types of vegetation that can be sustained within desert landscapes. Vegetation changes on the landscape over time change the diversity of the wildlife utilizing the area.

Cumulative impacts to vegetation resources within the Planning Area could increase as a result of an increased demand for renewable energy, such as wind, geothermal, and solar developments. The cumulative effects of energy development, transmission, and storage are likely to increase throughout the life of the plan. As the growing population of the West demands more energy, the BLM would continue to accommodate these needs

where practicable. Public lands could be marked with increased infrastructure and maintenance roads, which would likely increase the proliferation of OHV travel. The cumulative effect of energy development would be significant because the impacts would be to large areas of land for long durations of time.

The development and public use of recreational sites in the Planning Area have compacted and denuded significant areas, causing long-term erosion, sedimentation, decreased vegetative diversity, and loss of vegetative productivity. Open camping and firewood collection has led to diminished organic soil matter, decreased vegetative vigor, soil compaction in roads and campsites, and increased wind and water erosion rates.

Law enforcement or emergency search and rescue activities, including USBP activities, and human entry of the area by undocumented immigrants could potentially result in vegetation resource loss, which would be a cumulative impact.

4.6 Impacts on Wildlife Resources

BLM manages habitat for wildlife and therefore activities that result in surface disturbance to vegetation could result in impacts to wildlife habitat as well as direct mortality of individual wildlife species.

4.6.1 General Wildlife

Habitat loss is defined as temporary or permanent conversion of habitat to an unusable form for wildlife species. The level of loss is dependent upon the size and scale of the surface disturbing activity and could include, but is not limited to, geothermal leasing activities, recreational use, construction of new recreational facilities, road building, and ROWs. Temporary losses are impacts from construction or other surface-disturbing activities that would recover post-activity. Permanent losses include conversion of habitat from construction of permanent facilities and structures. Habitat loss would be minimal in the WA and ACECs, which are designated to protect sensitive resource values. Exclusion and avoidance areas would also help to protect sensitive resources (including wildlife habitat) by directing projects into less sensitive areas.

Habitat would be fragmented when a barrier preventing wildlife movement is sufficient to separate a species from portions of its habitat. Renewable energy (solar and wind) or geothermal development involving large areas of surface disturbance could result in fragmentation when the scale or level of the project is sufficient to prevent wildlife movement or to convert large areas into unsuitable habitat, leaving blocks of suitable habitat unconnected or fragmented.

Habitat quality is measured by the degree to which the habitat meets the minimum needs of an animal's environment, including food, water, and cover. Impacts to habitat

quality could include either degradation or enhancement depending on the activities or decisions implemented. Degradation could be caused by activities that would decrease access by wildlife to food, water, and cover. Enhancement could be caused by activities (e.g. vegetative management) that result in an increase to quality and/or quantity of food, water, and cover. Some of the vegetative management activities (e.g., non-native invasive plant species removal) would result in temporary degradation to habitat, but overall would result in enhancement of habitat quality due to restoration of natural ecosystem function and increased quality of forage. Human activity could spread non-native invasive plants resulting in degradation of native habitat. Wildlife habitat improvement projects (e.g., wildlife guzzlers) would increase the amount of available water.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Impacts to wildlife associated with geothermal development could include habitat degradation, fragmentation, or loss, as well as potential mortality of individual animals.

Recreational activities could result in degradation of wildlife habitat and mortality to individual animals through vehicle impacts and trampling. Construction activities could result in mortality through crushing and destruction of individual animals, nests, or burrows. Utility structures (e.g., power lines, wind turbines, communication towers) could result in bird and bat strike or electrocution. Undesirable species could be attracted into the Planning Area by human activities (e.g., ravens attracted to trash receptacles).

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP) as well as ancillary buildings, water storage and discharge facilities, fencing, access roads, and off-site facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height) as well as ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of

Indian Energy and Economic Development 2009c). Impacts to wildlife associated with solar and wind energy development could include habitat degradation, fragmentation, or loss, as well as potential mortality of individual animals.

4.6.2 Priority Wildlife Species

The priority wildlife identified by the BLM for management includes raptors, non-game migratory birds, bats, and game animals.

Foraging habitat could be impacted by vegetation management activities, which could temporarily reduce the prey base within the foraging areas. Manual and mechanical vegetation management would result in an increase in foraging area by reducing the vegetative understory while minimizing adverse effects to the prey base. Non-native invasive species removal could result in benefits to foraging habitat by promoting the success of native vegetation communities. Other ground-disturbing activities (such as discretionary construction) could alter or eliminate habitat areas for prey species thereby degrading raptor foraging habitat.

Vegetative management activities that result in narrow, linear surface disturbance could benefit some wildlife by exposing new and additional foraging habitat for edge-dwelling species. In particular, linear surface disturbance could benefit some non-game migratory bird species by opening the shrub canopy and encouraging annual growth which would support more seed-eating birds as well as birds feeding on insects supported by the new annual growth. Vegetative management activities could reduce the amount of roosting habitat available for tree-roosting bat species and the amount of cover available to some game species.

Non-native invasive plant species' removal could result in benefits to foraging habitat by promoting the success of native vegetative communities. Wildlife habitat improvement projects (e.g., wildlife guzzlers) would increase the amount of available water for priority species. In areas where water resources are a limiting factor, construction of these waters would concentrate game animals resulting in increased competition for vegetative resources in adjacent areas and a higher rate of disease transmission. In areas where water resources are not a limiting factor, construction of wildlife waters would promote population dispersal into underutilized areas. However, wildlife guzzlers could also increase the presence of predator species, such as coyotes and bobcats.

Within the Planning area, migratory and breeding bird abundance was found to be higher in areas closed to OHV recreation. Out of the 18 most common bird species found, seven were significantly more abundant in areas closed to OHV recreation. Significantly more migratory and breeding birds were found in areas closed to OHV recreation (e.g., North Algodones Dunes WA), and circumstantial evidence in the data

suggested that the best habitat within the Planning Area was also found in areas closed to OHV recreation (Appendix O).

Wind energy and other utility development could result in an increased mortality of individuals (e.g., bird and bat strikes, powerline electrocution). Other ground-disturbing activities (such as discretionary construction) could alter or eliminate foraging habitat. Motorized vehicle travel could result in bird strikes or destruction of ground nests.

4.6.3 Insect Species

Available data on insect species within the ISD indicate that human impacts on woody perennial plant populations appear to have the most immediate impact on the majority of endemic insect species as these woody plants are either the primary food source or are the food source for host or prey species. Current areas of high OHV recreation have different insect assemblages, which is likely due to changes in vegetation type and cover in these recreational areas. The presence of large numbers of visitors seems to primarily impact some of the endemic beetle species, whose spring adult activity coincides with several high visitor use weekends (Appendix G). Maintaining natural vegetation is vital to preserving native insects.

4.6.4 Differences between Alternatives

Some BLM land use plan decisions and authorized activities would be beneficial through habitat protection and enhancement, while others would be adverse by authorizing discretionary activities, such as development activities, that could result in detrimental effects to habitat.

Impacts to wildlife resources, including priority species, from geothermal development would vary by alternative. Geothermal development would adversely impact the least amount of acres under Alternatives 3 and 4. Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing and under Alternative 8, 35,115 acres would be available for geothermal leasing. Under these alternatives, moderate adverse impacts to wildlife resources would occur as compared to Alternatives 3 and 4. Under Alternatives 1, 2, and 7, lands available for geothermal development would increase and, in turn, potential adverse impacts to wildlife resources would be greater. Under these alternatives, there would be increased potential for the loss of habitat, disturbance of species communities, and direct mortality due to geothermal construction and development activities within the Planning Area (see Table 4-1).

OHV area designations would adversely impact wildlife resources, including priority species, the least under Alternatives 2 and 3 (see Table 4-1). The greatest number of acres closed or limited to OHV recreation is found under these alternatives. Motorized travel would not be authorized within proposed closed OHV management areas, and

loss of habitat, disturbance of species communities, and direct mortality from OHV recreation would no longer occur. Under Alternatives 4, 5, and 6, adverse impacts to wildlife resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8. Under Alternatives 1, 7, and 8 there would be increased acreages open to OHV recreation resulting in an increased number of acres of habitat potentially lost or disturbed within the Planning Area (see Table 4-1).

Adverse impacts to wildlife resources, including priority species, from solar and wind development would the lowest under Alternatives 3 and 8. Under Alternatives 4, 5, and 6, adverse impacts to wildlife resources would be greater than under Alternatives 3 and 8 but less than under Alternatives 1, 2, and 7. Under Alternatives 4, 5, and 6 there would be 144,290 acres of land designated as avoidance areas. Under Alternatives 1, 2, and 7, lands available for solar and wind development would increase and, in turn, potential adverse impacts to wildlife resources would be greater. Under these alternatives, there would be increased acreages of construction and development for solar and wind sites within the Planning Area (see Table 4-1).

4.6.5 Unavoidable Adverse Impacts

Illegal kill, harm, harassment, removal, or capture of game and non-game animals, including eggs, could result in unavoidable loss to individual animals.

Climate changes, including extended drought cycles, could potentially decrease the availability of surface water for use by wildlife within the Planning Area.

Law enforcement or emergency search and rescue activities, including USBP activities, occurring in areas supporting priority species could result in unavoidable adverse impacts to wildlife resources. These impacts could be caused by flushing wildlife from cover and disrupting natural processes, such as breeding behavior or foraging, and could result in direct or indirect mortality. Human entry and use of the area by undocumented immigrants could result in unavoidable adverse impacts to these species through litter deposition, trampling of habitat, and flushing of wildlife.

4.6.6 Short-term Use and/or Long-term Productivity

Habitat converted to permanent facilities or structures would result in a net loss of wildlife habitat as long as those facilities or structures remain in use.

4.6.7 Cumulative Impacts

With the continued use and development of BLM neighboring lands, cumulative impacts to wildlife habitat are likely to persist in the Planning Area and surrounding areas into the foreseeable future. Species most likely to be affected are invertebrate species. Biological

resources on public lands may be affected by off-site use and development regardless of the DRAMP alternative selected.

The impacts from increased local emissions from vehicles are well documented on humans. The overall impacts to wildlife species are unknown. Direct impacts of OHV recreation or cross-country travel have been well documented, and include destruction of soil stabilizers, soil compaction, reduced rates of water infiltration, increased wind and water erosion, noise, decreased abundance of wildlife populations, and destruction of vegetation and habitat.

The paving and expansion of road networks could adversely impact wildlife due to increased volume of vehicle travel at higher speeds. Much of the habitat described as microphyll woodlands is sustained by sheet flow from the neighboring desert pavement and mountain complexes. As these areas are interrupted by roadway or other ROW development, flow patterns are disturbed. Rain events are more likely to pool up and evaporate in roadway depressions and tracks or collect beside the ROW. Flows may be permanently interrupted and no longer feed certain wash woodlands.

The presence of humans, their activities, and noise reduce the value of vegetation to wildlife. Increased dispersed camping and/or day use may cause loss of such vegetation, which could affect deer, reptiles, and migratory birds.

4.7 Impacts on Special Status Species

The general habitat impacts for all special status species are described above in the Vegetative (Section 4.5) and Wildlife (Section 4.6) resources sections. The information below refers specifically to the special status species found within BLM-administered lands in the Planning Area. The USFWS has identified two federally listed species as occurring within the Planning Area: PMV and Mojave Desert tortoise (USFWS 2009). There are four State of California listed threatened or endangered, or rare species: Wiggin's croton, Algodones Dunes sunflower, Gila woodpecker, and Arizona Bell's vireo. There are 14 BLM Sensitive species: Munz's cholla, giant Spanish needle, sand food, Orocopia sage, spotted bat, California leaf-nosed bat, cave myotis, Townsend's big-eared bat, burrowing owl, LeConte's thrasher, lowland leopard frog, Couch's spadefoot toad, flat-tailed horned lizard, and Colorado Desert fringe-toed lizard.

The analysis in this section focuses on impacts to special status species as a result of management actions that affect species or their populations and changes to the condition of their habitats.

The following assumptions were used in the analysis:

- Local populations are naturally affected by non-human-caused factors such as climate, natural predation, disease outbreaks, natural fire regimes, and competition for available habitat from other native species.
- Ground-disturbing activities could lead to modification (beneficial or adverse), loss (short-term or long-term), or fragmentation of special status species habitat and/or loss or gain of individuals, depending on the amount of area disturbed, species affected, and location of the disturbance.
- Changes in air, water, and habitat quality could lead to direct impacts and could have cumulative impacts on species survival.
- Impacts on special status species could be more significant than impacts on non–special status species.
- The USFWS would be consulted on any action that could potentially affect any listed plant or animal species or their habitat.

In accordance with Section 7(a) 2 of the ESA of 1973, as amended, the BLM ECFO would initiate Section 7 consultation with the USFWS. This process involves preparing a biological assessment (BA) that includes impact analyses and subsequent determinations for all federally listed and proposed species. The BA considers potential project-related effects (direct and indirect) on each species and its habitat from the management actions presented in the DRAMP/DEIS. Additional consultation with the USFWS would still be required for all implementation-level activities if they would be implemented within suitable or potentially suitable habitat for federally listed species.

Various laws, regulations, and policies require that special status species be fully analyzed in any BLM decision that could affect those species or their habitat. Analysis would include inventory, monitoring, evaluation, and identification of mitigation of effects. Mitigation actions would include project relocation or redesign (avoidance), monitoring, and site-specific mitigation.

The number of species that could be affected by various actions is directly correlated with the degree, nature, and quantity of surface disturbing activities in the Planning Area. Impacts are quantified where possible. In the absence of quantitative data, best professional judgment was used. To ensure preservation of specific species, further analyses would be required at the implementation level following site-specific species inventories.

Three general categories of impacts would be anticipated to be the most influential on special status species and their habitat—habitat alteration, fragmentation, and/or loss; displacement; and habitat enhancement. Habitat alteration occurs when decisions change the existing habitat character. Surface-disturbing activities, development, or

other activities that degrade habitat could lead to habitat alteration, fragmentation, or loss. Habitat alteration, fragmentation, and loss may affect the usable ranges and routes for special status species wildlife movement. In addition, loss of habitat for pollinators of special status plants could result in the decline or loss of special status plant populations.

Special status species wildlife displacement occurs when land use activities result in the movement of wildlife into other habitats, increasing stress on individuals, and increasing competition for habitat resources. Impacts on special status species from displacement depend on the location, extent, timing, and/or the intensity of the disruptive activity or human presence. Occurrences of these disruptive activities in areas adjacent to special status species habitat cause displacement. Impacts from displacement could be greater for special status species with limited existing habitat and/or a low tolerance for disturbance. Habitat maintenance and enhancement could maintain or improve the condition of vegetation and levels of forage species and maintain existing erosion rates or reduce soil loss through vegetation treatments and restrictions on surface disturbing activities.

Impacts on special status species are not anticipated as a result of implementing management actions for the following resources and designations: air quality, water resource management, cultural resource management, and paleontological resource management.

4.7.1 Habitat Alteration, Fragmentation, and/or Loss

Authorized vegetative treatments would be conducted in localized areas where invasive species (specifically tamarisk) occur. The short- and long-term impacts associated with these actions would not be detrimental to the species and their associated habitat given the limited footprint of such actions on the landscape. Over the long term, the treated areas would provide improved vegetation communities, which would enhance habitat for some special status species.

Permitted surface-disturbing activities cause habitat alteration, fragmentation, and/or loss depending on the type, amount, and location of activity. Habitat fragmentation occurs when contiguous habitat is broken up (fragmented) by surface-disturbing activities, causing a reduction in usable ranges; disruption of movements among habitats, transitional areas, and breeding areas; isolation of smaller, less mobile species; and increase in habitat generalists that are characteristic of disturbed environments (Harris 1991).

Locatable (e.g., gold, silver) and salable (e.g., sand, gravel) mining activities would result in habitat alteration, damage or injury to individuals (plants and wildlife), damage to plant seed banks, and loss of pollinators. Leasable mineral activities (geothermal) would result

in alteration of habitat at well pad locations, access roads, transmission and generation infrastructure, and potential releases of geothermal fluids. Pipelines could alter sand flow and movement.

Mineral resource activities and construction of associated facilities could result in the loss of special status species habitat. Special status species habitat losses include potential habitat for special status species plants; cover for small reptiles and amphibians; winter concentration, nesting, and foraging habitat for birds; and roost and foraging areas for bats. In addition, the loss of habitat for pollinators of special status plants could result in the decline or loss of plant populations. Seclusion areas for special status wildlife species would become smaller, more fragmented, and dispersed in these areas, which could lead to a decrease in populations as a result of habitat loss.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Impacts to special status species associated with geothermal development could include habitat degradation, fragmentation, or loss; potential mortality of individual animals, and damage to or death of individual plants.

Impacts would be minimal for locatable mineral development because a plan of operation, including a reclamation plan, is required prior to development of locatable minerals. The development of locatable minerals and mineral materials could cause localized impacts on special status species through the disturbance of habitat.

Recreation activity likely would have an effect on special status species and their habitats. Motorized use would have greater effects than non-motorized use. Recreationists could introduce noise that could disturb species during sensitive periods, which could indirectly affect reproduction or cause species to abandon areas, such as nest sites or areas containing key habitat components containing important food sources. Stress inflicted on species could also deteriorate species health, which could affect survivability. Displaced wildlife incurs a physiological cost through excitement (preparation for exertion) and/or through locomotion. A fleeing or displaced animal incurs additional costs through loss of food intake and potential displacement to lower quality habitat. Chronic or continuous disturbance could result in reduced animal fitness and reproductive potential, and abandonment of young (mortality; Geist 1978). Effects likely would be greater in areas that receive frequent and/or intense recreation use; however, the number of areas of frequent and/or intense recreation use is small. Although damage to special status species habitats would continue to be monitored, impacts from

dispersed use would not be apparent until after the damage has occurred, which would then be appropriately mitigated to the extent practical and feasible.

Construction and/or maintenance of recreational facilities, including but not limited to roadways and buildings, could result in impacts to special status species through alteration of habitat or damage to individual plants or wildlife.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Impacts to special status species associated with solar and wind energy development could include habitat degradation, fragmentation, or loss; potential mortality of individual animals, and damage to or death of individual plants.

Authorized lands and realty activities would result in alteration of habitat at development locations, access roads, transmission, and generation infrastructure. Ground-level linear features (e.g., canals, pipelines, fences, roadways) could alter sand flow and movement and potentially fragment special status species habitats. Impacts from apiaries could result in competition with native pollinators. Any lands acquired by BLM would have the same or similar impact as adjacent BLM-administered lands.

ROW development (including power lines, pipelines, and communication sites) would disturb habitats that could be occupied by special status species where ROW developments are authorized. Most ROWs would be located in common (within existing or shared ROWs), which would result in concentrated surface disturbances and habitat deterioration or loss. Special status plants would be most affected by ROW development due to their inability to seek alternative habitats, whereas the majority of special status wildlife could seek alternative habitats if available. ROWs located in common could also reduce the degree of habitat fragmentation within the Planning Area if properly located outside of or on the fringe of special status species habitat. Locating ROWs in common could increase habitat loss or fragmentation if improperly located through known habitat.

Authorized vehicles, including but not limited to emergency response and law enforcement, on patrol and responding to incidents could result in disturbance or

injury/damage to special status plant and wildlife species. Authorized helicopter landings in known special status plant habitat could result in sand dispersal and damage to individual plants. UXO explorations and detonations could result in damage to special status species individuals and habitat as ordnance is found, exhumed, or destroyed. Hazardous material removal within special status species habitat could result in impacts to individuals, habitat, and plant pollinators.

4.7.2 Federally Listed Species

4.7.2.1 Peirson's Milk-vetch

The PMV was federally listed as a threatened species due to destruction of plants and modification of habitat associated with OHV recreation and associated recreational development (USFWS 1998). OHV recreation can impact PMV habitat by:

1. Disrupting the natural processes that support dune formation, movement, and structure, could disrupt the available habitat needed for individual and population growth;

2. Causing the collapse of dune faces and ridges, which could result in burial of the seed bank;

3. Disturbing surface sand, thereby decreasing soil moisture needed for establishment of individual plants and population growth; and

4. Degrading the psammophytic scrub vegetation community that provides habitat for pollinators required for reproduction.

Impacts discussed in Impacts on Vegetative Resources (Section 4.5) would likely also apply to PMV communities. Adverse modification of PMV critical habitat could result from construction activities (e.g., geothermal, wind, solar, recreation facilities) that destroy or adversely modify important habitat features.

OHV recreation or walking may disturb the sand surface and may result in increased evaporative water loss in the dunes (Porter et al. 2005) and reduced water availability to PMV. The impacts to PMV habitat from recreational activities would also include crushing of plants via OHV and other vehicle traffic. Occasional non-motorized (e.g., hiking, equestrian) use could also result in damage to individual plants. Churning of the sand has been known to alter soil structure, which could impact PMV habitat. Disruption of the soil by OHV recreation could lead to additional damage to germinating seedlings.

4.7.2.2 Mojave Desert Tortoise

Primary threats to Mojave desert tortoise are related to loss and degradation of the species' habitat, through drought, wildfire, habitat destruction and fragmentation, and invasion of exotic plant and wildlife species. Other impacts to the species include removal of individuals from the wild, vandalism, mortality from vehicles, irresponsible OHV recreation, release of captive tortoises into the wild, and disease.

Construction activities may impact desert tortoise in a variety of ways, including: loss of habitat by the project footprint; incidental destruction of habitat in a buffer area around the footprint; damage to soil on the periphery of the project area; incidental death of unseen tortoises along roads, beneath crushed vegetation, or in undetected burrows; destruction of burrows; handling of tortoises; entrapment of tortoises in pits or trenches dug for transmission or fiber optic lines, water, and gas pipelines and other utilities; attraction of ravens and facilitation of their survival by augmenting food and water; and fugitive dust. Construction of a natural gas pipeline would have the greatest adverse impacts on tortoise and habitat, construction of a transmission line would have intermediate adverse impacts, and construction of fiber optic lines would have the most benign impacts. The differences are largely related to the scale of the projects, ability of crews to avoid disturbing burrows, and timing of construction to avoid peak activity periods for tortoises (spring and summer; Boarman 2002).

Energy developments, such as geothermal, solar, and wind energy generation, could result in habitat destruction and direct mortality from: off-road travel to explore and access sites; habitat loss to road and development construction; fugitive dust and soil erosion; and developments to support operations. Most of these energy sites would be point sources of disturbance with potentially little effect beyond the immediate site of development. Energy development sites result in direct and indirect loss of habitat, fragmentation of habitat and population, and increase access roads which can lead to direct mortality from vehicle use (Boarman 2002).

Anthropogenic noise and vibrations may adversely impact tortoises in several ways, including: disruption of communication and damage to the auditory system. Hierarchical social interactions, hearing, and vocal communication have all been identified in desert tortoise. It is likely that repeated or continuous exposure to damaging noises cause a greater reduction in auditory response (Boarman 2002).

OHV recreation may adversely affect tortoise populations in multiple ways: direct mortality by crushing tortoises on the surface or in burrows; indirect mortality through habitat alteration from soil compaction; vegetation destruction (direct or indirect); and, toxins from exhaust. In heavy OHV recreation areas, evidence has shown that desert tortoise population densities decline (Boarman 2002).

OHV recreation in desert tortoise habitat would result in disturbance to the soil, which could break down microbiotic crusts that support the vegetation, thereby degrading tortoise habitat. OHV recreation could prevent recruitment of perennial plant species, and cause injury to annual plant species that are important food sources for the tortoise.

Ravens are reported to be a significant predator of the desert tortoise. Ravens have been observed preying on juvenile tortoises as well as adults (Boarman 2002). Areas with trash receptacles may attract a larger number of ravens, which in turn may increase the likelihood of predation on desert tortoise.

Access routes through microphyll woodland habitat and open desert wash areas would result in direct impacts to the desert tortoise through running over tortoises or crushing of burrows.

4.7.3 State-listed and BLM Sensitive Species

Vegetation enhancement activities would improve the quality of native habitat and its ability to support these species. Surface disturbing authorizations (wind, solar, and geothermal leases) could result in an impact to special status species through habitat conversion. Impacts described in Section 4.5, Impacts on Vegetative Resources and Section 4.6, Impacts on Wildlife Resources, would also apply to state-listed and BLM sensitive species.

It has been shown that prolonged noise could adversely affect some lizards and small mammals. Investigations by Brattstrom and Bondello (1983) on the effect of OHV noise included the desert kangaroo rat (*Dipodmys deserti*), desert iguana (*Dipsosaurus dorsalis*), and Mohave fringe-toed lizard (*Uma scoparia*). Desert kangaroo rats and fringe-toed lizards demonstrated an immediate loss of hearing when exposed to OHV sounds of 95 dBA. Recovery of the kangaroo rat hearing took several weeks, during which time they would have been more vulnerable to predation. Effects would be more likely where prolonged noise occurs. A single OHV can generate a noise level of 92 dBA at 50 feet, although the duration of the exposure is likely to be quite short as a vehicle passes by. Wildlife exposure to OHV noise is localized and only at high levels during the six major holiday weekends during the recreation season.

OHV recreation tends to be concentrated within the psammophytic scrub. As a consequence, some special status species such as the Colorado Desert fringe-toed lizard and endemic dune beetles occurring in these dunes would be killed or injured by OHV recreation. OHV recreation could affect Couch's spadefoot toad habitat through disturbance of small ephemeral pools for which this species depends. The tendency for Couch's spadefoot toad to aggregate during breeding season would place it at a higher risk from an increase in OHV recreation in this area.

Human activities could result in disturbance to special status plant species through direct impact to the plants or degradation of native habitat. Human activities include, but are not limited to, OHV recreation, camping (including recreational vehicles), hiking, and other recreational activities. Concentrated recreational use in open OHV areas would likely result in the loss or displacement of special status wildlife species.

4.7.4 Differences between Alternatives

4.7.4.1 Federally Listed Species

4.7.4.1.1 Peirson's milk-vetch

Impacts to PMV from geothermal leasing would vary by alternative. Geothermal leasing would have the greatest adverse impacts to PMV under Alternatives 1, 2, and 7. Under these alternatives, 188,426 acres (88 percent) of the Planning Area, except the North Algodones Dunes Wilderness, would be available for geothermal leasing and surface occupancy (see Table 4-1 and Map 2-7). Under these alternatives, PMV critical habitat would not be excluded from geothermal energy development surface occupancy. Under Alternatives 5 and 6, 11,939 acres (5 percent) of the Planning Area would be available for geothermal leasing and surface occupancy (see Table 4-1 and Map 2-10). These alternatives include a small portion of PMV critical habitat south of SR-78. Under Alternative 4, 188,426 acres would be available for geothermal leasing; however, no surface occupancy would be allowed (see Table 4-1 and Map 2-9). PMV critical habitat would likely not be adversely impacted under this alternative. Under Alternative 3, no geothermal leasing would be allowed within the Planning Area (see Table 4-1 and Map 2-8). Under this alternative, PMV critical habitat would not be adversely impacted by geothermal development. Under Alternative 8, 35,115 acres would be available for geothermal leasing, however, PMV critical habitat is not included in available lands and would not likely be adversely impacted under this alternative.

Under Alternative 1, 2,845 acres of PMV critical habitat would be closed to OHV recreation, while the remainder of the Planning Area would be limited (1,385 acres) or open (7,661 acres) to OHV recreation (see Table 4-1, Table 4-6 and Map 2-19). OHV recreation within the open OHV recreation areas of critical habitat would likely result in the loss of habitat, disturbance of species, and direct mortality from OHV recreation. Under Alternative 2, 2,275 acres of PMV critical habitat would be open to OHV recreation, with 9,617 acres closed (Table 4-6 and Map 2-20). Under Alternatives 3 and 5, only 9 acres of PMV critical habitat would be open to OHV recreation (Table 4-6). Motorized travel would not be authorized within 11,882 acres of proposed closed OHV management areas, and loss of habitat, disturbance of species, and direct mortality from OHV recreation would not occur (Table 4-6, Maps 2-21 and 2-23). Under Alternative 4, adverse impacts to PMV critical habitat would be greater than under Alternatives 3 and 5 but less than under Alternatives 1, 2, 6, and 7 (Table 4-6 and Map 2-22). Under this

alternative, 9,353 acres of PMV critical habitat would be closed to OHV recreation and 1,527 acres would be open to OHV recreation. A small portion, 1,012 acres, of PMV critical habitat would be designated as a seasonal restriction area (limited OHV) based on a rainfall threshold (Map 2-22). Under Alternatives 6 and 7, a portion of PMV critical habitat would be closed to OHV recreation (Table 4-6, Maps 2-24 and 2-25). Under Alternatives 6 and 7, there would be 5,271 and 3,394 acres, respectively, open to OHV recreation within the Planning Area. Critical habitat units known to have the highest densities of PMV would be closed to OHV recreation under these alternatives (6,620 acres under Alternative 6 and 8,497 acres under Alternative 7). All PMV critical habitat would be closed to OHV recreation under Alternative 8. Motorized travel would not be authorized within PMV critical habitat of proposed closed OHV management areas; loss of habitat, disturbance of species, and direct mortality from OHV recreation would not occur.

TABLE 4-6
POTENTIAL OHV IMPACTS TO PEIRSON'S MILK-VETCH CRITICAL HABITAT BY ALTERNATIVE (ACRES)

	Alternative							
	1	2	3	4	5	6	7	8
PMV Critical Habitat								
Open OHV	7,661	2,275	9	1,527	9	5,271	3,394	0
Closed OHV	2,845	9,617	11,882	9,353	11,882	6,620	8,497	11,891
Limited OHV	1,385	0	0	1,012	0	0	0	0

Under Alternatives 1, 2, and 7, lands available for solar and wind leasing would be the highest, resulting in greater potential adverse impacts to PMV critical habitat. Under these alternatives, 188,833 acres would be available for solar and wind development, including most portions of PMV critical habitat, except that found in the North Algodones Dunes Wilderness (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss of habitat, disturbance of species, and direct mortality of PMV. Under Alternatives 3 and 8, all portions of PMV critical habitat are excluded from solar and wind development (see Table 4-1 and Maps 2-30, 2-32, 2-34, and 2-36), and no adverse impacts to PMV critical habitat are likely to occur. Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas, including portions of PMV critical habitat. An avoidance area is defined as an area only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization. PMV critical habitat may be adversely impacted under these alternatives, if solar and wind energy proposals have no other reasonable location. Under these alternatives, critical habitat within the North Algodones Dunes Wilderness would continue to be excluded.

4.7.4.1.2 Mojave Desert Tortoise

Impacts to Mojave desert tortoise from geothermal development would vary by alternative. Geothermal development would have the greatest adverse impacts to desert tortoise under Alternatives 1, 2, 7, and 8. Under these alternatives, all of potential desert tortoise habitat along the eastern portion of the Planning Area (east of the UPRR tracks), would be available for geothermal development and surface occupancy (see Table 4-1, Maps 2-7 and 2-11). Under Alternative 3, no geothermal development would be allowed within the Planning Area (see Table 4-1 and Map 2-8). Under this alternative, desert tortoise habitat would not be adversely impacted by geothermal development. Under Alternative 4, 188,426 acres of the Planning Area would be available for geothermal development but with an NSO stipulation (see Table 4-1 and Map 2-9). Desert tortoise habitat within the Planning Area would likely not be adversely impacted under this alternative. Under Alternatives 5 and 6, 11,939 acres (5 percent) of the Planning Area would be available for geothermal development and surface occupancy (see Table 4-1 and Map 2-10). Only a small portion of these acres are located within potential desert tortoise habitat (north of SR-78, east of the UPRR tracks). Under these alternatives, adverse impacts to desert tortoise may occur but would likely be minimal overall.

Under all alternatives, Mojave desert tortoise habitat east of the UPRR tracks would continue to be limited to OHV recreation. Limited OHV recreation would likely result in minimal loss of habitat, disturbance of species, and potential direct mortality from OHV and other recreation, as well as from other motorized vehicles.

Under Alternatives 1, 2, and 7, lands available for solar and wind development would be the highest, resulting in greater potential adverse impacts to desert tortoise habitat. Under these alternatives, 188,833 acres would be available for solar and wind development, including all of potential desert tortoise habitat (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss of habitat, disturbance of species, and possible direct mortality of tortoise. Under Alternatives 3, 4, 5, 6, and 8 the majority of tortoise habitat would also be available for solar and wind development (see Table 4-1 and Maps 2-30, 2-31, 2-32, 2-34, 2-35, and 2-36); adverse impacts to tortoise and potential habitat may occur under these alternatives as well.

4.7.4.1.3 State-listed and BLM Sensitive Species

Impacts to special status plant species from geothermal development would vary by alternative. Under Alternatives 1, 2, and 7, the majority of the Planning Area, 188,426 acres, would be available for geothermal development and, in turn, potential adverse impacts to special status species would be greater. Under these alternatives, there would be increased potential for the loss of vegetative resources, loss of habitat, disturbance of species, and potential direct mortality due to geothermal construction and development activities within the Planning Area (see Table 4-1). Geothermal development would have the lowest potential adverse impacts under Alternative 3.

Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8). Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 188,426 acres of the Planning Area would be available for geothermal development but with an NSO stipulation (Map 2-9). Under Alternatives 5 and 6, geothermal development would be limited to 11,939 acres within the Planning Area (see Table 4-1 and Map 2-10). Under Alternative 8, geothermal leasing would be limited to 35,115 acres with 136,691 acres of NSO stipulation. Under Alternatives 5, 6, and 8 adverse impacts to special status species would be concentrated in a relatively small portion of the Planning Area (five to 16 percent, respectively).

OHV area designations would have the highest level of potential adverse impacts to special status species under Alternative 1. Under this alternative, the majority of the Planning Area, excluding the WA (26,098 acres), would be open or limited OHV recreation, increasing the potential for loss of habitat, disturbance of species communities, and potential direct mortality from OHV recreation activities. Under Alternatives 7 and 8, adverse impacts would be similar to those under Alternative 1; however, 36,743 and 35,144 acres, respectively, would be closed to OHV recreation under these alternatives, protecting 10,645 and 9,046 more acres than Alternative 1. Under Alternatives 2 and 3, the greatest number of acres (75,322 and 87,778 acres, respectively) would be closed to OHV recreation. Motorized travel would not be authorized within proposed closed OHV management areas, and loss of habitat, disturbance of species communities, and potential direct mortality from OHV recreation would no longer occur. Under Alternatives 4, 5, and 6, adverse impacts to wildlife resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8 (see Table 4-1).

Under Alternatives 1, 2, and 7, lands available for solar and wind development would be the highest, resulting in greater potential adverse impacts to special status species. Under these alternatives, 188,833 acres would be available for solar and wind development (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss of habitat, disturbance of species, and possible direct mortality. Adverse impacts to special status species from solar and wind development would be the lowest under Alternatives 3 and 8 as these alternatives reduce the number of acres available for development. Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas. An avoidance area is defined as an area only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization.

For each of the alternatives, potential adverse impacts of OHV recreation to Colorado Desert fringe-toed lizards and flat-tailed horned lizards were considered in detail. For these species, it is assumed that all areas of psammophytic scrub and creosote bush scrub are occupied habitat. Under Alternative 1, the majority of habitat for these species

would be open or limited to OHV recreation (about 78 percent of the Planning Area), potentially resulting in loss or displacement of species. Under Alternatives 2 and 3, the highest number of acres would be closed to OHV recreation (30 to 34 percent of the Planning Area), resulting in lessened adverse impacts to these species. Under Alternatives 4, 5, 6, and 7, and 8 adverse impacts to species and habitat would be similar to those discussed under Alternative 1, although more acres of the psammophytic scrub vegetation community would be closed to OHV recreation under these alternatives, protecting additional acres of important habitat for these species.

4.7.5 Unavoidable Adverse Impacts

Wildfire occurrences, suppression activities, and burned areas could result in an unavoidable impact to special status species on BLM-administered lands within the Planning Area.

Climate changes, including extended drought cycles, could potentially decrease the availability of water that supports these species and their habitats within the Planning Area.

Law enforcement or emergency search and rescue activities, including USBP activities, occurring in areas supporting special status species could result in unavoidable adverse impacts through trampling and disturbance. Other human entry and use, including entry by undocumented immigrants, could also impact sensitive resources through trampling of habitat and direct or indirect mortality.

4.7.6 Short-term Use and/or Long-term Productivity

Habitat converted to permanent facilities or structures would result in a net loss of special status species habitat as long as those facilities or structures remain in use.

4.7.7 Cumulative Impacts

Land use plans in the region of the Planning Area that may result in cumulative impacts include NEMO, NECO, WEMO, and WECO.

Cumulatively, these actions and trends could cause the displacement of OHV recreation from the Planning Area to other areas or from other areas to the Planning Area. It is unknown, and difficult to predict, where the visitation shift would occur. It is possible that the shift could occur into areas that currently require little recreational management or have more sensitive habitats and species, resulting in an adverse impact on species, although each of these plans was developed with an emphasis on species and habitat conservation.

The USBP frequently uses the Planning Area, and other desert areas in the vicinity, for surveillance and apprehension of undocumented immigrants. These activities result in surface disturbance, as well as habitat and species loss.

The Salton Sea Restoration Plan, the Coachella Valley Water Management Plan and the Imperial Irrigation District Water Conservation and Transfer Project and Habitat Conservation Plan each have the potential for surface disturbance, as well as habitat and species loss.

The Mesquite Mine has created some loss of habitat to the desert tortoise. The mine has a program to physically relocate tortoise that may be impacted by the mining operations to a different location.

Impacts of OHV recreation or cross-country travel on wildlife species, including special status species, has been well documented and includes destruction of soil stabilizers, soil compaction, reduced rates of water infiltration, increased wind and water erosion, noise, decreased abundance of wildlife populations, and destruction of vegetation.

OHV recreation impacts reptiles and amphibians, specifically tortoise, and affects the amount and quality of forage available to species when they emerge from winter hibernation. Roads and highways pose several direct and indirect threats to populations. Roads and highways are considered the greatest cumulative threat to tortoise populations and may also impact other special status wildlife species. As barriers, roads inhibit dispersal and subsequent gene flow between subpopulations and metapopulations. In providing access to species populations, particularly tortoise, roads and highways foster such threats as development, vandalism, and collecting. Increased diversity and productivity of vegetation resulting from enhanced hydrological conditions along roadway edges attracts wildlife and thereby places them at a greater risk of direct mortality from both predators and motorized vehicles. Roadkills are a substantial source of mortality for many wildlife species, including special status species (Boarman et al. 1997).

The paving and expansion of road networks could adversely impact special status species due to increased volume of vehicle travel at higher speeds. Much of the habitat within microphyll woodlands and wash-dissected creosote scrub are sustained by sheet flow. As barriers in the form of roadway development occur, water flow patterns are disturbed. Rain events are more likely to pool up and evaporate in roadway depressions and tracks or collect adjacent to the ROW. Flows may be permanently interrupted and no longer feed certain vegetation communities.

The presence of humans, their activities, and noise decreases habitat suitability for special status species. Increased dispersal camping and/or day use may cause loss of vegetation, which could have an adverse impact on special status species.

4.8 Impacts on Wildland Fire

Primary impacts to wildland fire are characterized as those actions that limit or enhance the ability to suppress fire, or that alter naturally occurring fire regimes. Actions that enhance the ability to suppress fire include, but are not limited to, vegetation and invasive species removal. Nearby community fire departments, such as Imperial County or Winterhaven, are the primary fire protection agencies for BLM-administered lands in the Planning Area.

Continued use of the existing communication sites and utility ROWs and potential reasonable foreseeable development of any lands and realty-related uses is expected to temporarily affect fuels and fire because of ground disturbance and increased opportunities for accidental human caused-ignition during construction, operation, and maintenance. More improvements and structures would do the following:

- Affect suppression and costs by placing more on-the-ground features that could require protection from a wildfire
- Present more hazards, such as flight hazards from overhead power lines or explosion hazards of buried gas pipelines
- Create restrictions to prescribed burning

ROWs, utility corridors, and other such authorizations inadvertently create fuel breaks and provide access routes for wildfire suppression. Stipulations specific to each authorization reduces the potential threat of accidental ignition of wildfires during construction or maintenance.

Areas with more potential development and recreation use could affect fire management by increasing the risk of accidental human-caused ignitions. Increased visitation, camping, and OHV recreation increases potential for cigarettes, campfires, and sparks emitted by OHVs to ignite fires.

International border issues such as undocumented immigration, illegal drug trafficking, and associated crime result in increased potential of human caused fire, which in turn raise the risk to firefighter safety.

4.8.1 Differences between Alternatives

Impacts to wildland fire management would be similar under each of the alternatives.

4.8.2 Unavoidable Adverse Impacts

The presence of sensitive cultural and natural resources limit the ability to suppress wildland fire. The impacts of these resources on the fire program are unavoidable and sometimes adverse.

Climate changes, including extended drought cycles, could increase the potential for wildland fires in frequency and intensity.

4.9 Impacts on Cultural Resources

Cultural resources (also referred to as heritage resources) are subject to a variety of impacts as a result of the multiple uses that occur on BLM land. Primary concern is typically focused on the potential for adverse impacts; however, beneficial impacts could also occur as a result of management decisions. For the purposes of this document, adverse impacts are characterized as actions that result in the loss, destruction, or degradation of significant cultural resources. Significant resources are those that are eligible for nomination to the NRHP or those that have been placed on the register. Unevaluated cultural resources are assumed to be eligible for nomination to the NRHP for the purposes of cultural resource management decisions.

Significant heritage resources are referred to as historic properties by agencies such as the SHPO and the NRHP. These are typically historic structures, historic sites, or prehistoric archaeological sites. A number of other types of heritage resources exist: historic districts, archaeological districts, traditional cultural properties, and cultural landscapes. Since heritage resources are finite and non-renewable, prevention of adverse impacts is always preferred. The analysis of potential impacts to cultural resources, both adverse and beneficial, was based on review of existing literature and the expertise of BLM resource specialists.

Land managers have multiple ways to try to minimize impacts to heritage resources. These measures are based on the kinds of threats to the resources and the natural environment of the site. For example, if OHVs are running over a site, managers could try to re-route traffic away from the site, place post and cable barriers around the site, fence the site, or close the area to vehicular traffic. If camping is impacting a site, the site could be fenced, signed, and interpreted for the public.

Many changes in land use and permitted new uses are considered undertakings under NEPA and the NHPA. In these cases, impacts to heritage resources are considered in the permit process. If adverse impacts cannot be avoided, then the cultural resource may be excavated as part of a data recovery plan to gather information before damage occurs. Sometimes off-site mitigation measures are conducted. This might require additional archival research and additional ancillary studies (e.g., pollen studies, trace

protein analysis, thermoluminescence dating). In addition to these or instead of them, on Historic Period sites, an oral history program might be conducted along with additional archival research.

BLM land use decisions that authorize surface-disturbing activities may result in adverse impacts to cultural resources. Resources could be disturbed, exposed, or lost during these activities. Compliance with Section 106 of the NHPA and other applicable cultural resource laws and regulations would be completed before implementing specific projects resulting from DRAMP decisions. Direct impacts on cultural resources are typically related to the level of ground disturbance associated with a project. Ground disturbance, whether for facilities improvements or other activities, is the primary factor affecting archaeological sites and sites with Native American heritage values. Indirect impacts are less associated with the intentional changes being produced by the project. These could include such things as changes to or new travel access routes that lead to greater access to an area, thus increasing the potential for illegal collecting by the public. Erosion-control measures that alter deposition patterns and lead to greater erosion or sedimentation could also indirectly affect cultural resources.

Examples of ground-disturbing actions that would need project specific NEPA documentation and compliance with cultural resource laws and regulations include proposed communication sites, ROWs, recreation area improvements, habitat restoration, road construction and improvements, and others. Potential impacts (direct and indirect) to cultural resources are categorized below and divided into destruction or degradation and beneficial.

The following assumptions were made in determining impacts resulting from the proposed alternatives:

- The current cultural resources database for the Planning Area is representative of the range of resources present, even though only a small portion of the Planning Area has been surveyed for cultural resources.
- Ground disturbance that affects cultural resources could cause irreversible damage to these nonrenewable resources.
- Owing to the nature of shifting sands, and particularly their depth, regardless of the level of inventory, some resources may not be identified.
- Greater access to an area through time could present more opportunities for illegal artifact collection, as well as more ground disturbance.
- Conversely, reduced access over time could produce beneficial impacts by reducing opportunities for unauthorized artifact collection, and reduced ground disturbance.

Employing these assumptions, and what is currently known of the cultural resources of the Planning Area, extrapolations were made below regarding the extent of impact to cultural resources that would result from proposed alternatives.

4.9.1 Direct and Indirect Impacts to Cultural Resources

Loss or degradation of NRHP-listed or eligible cultural resources could occur from natural deterioration (such as that caused by water or wind erosion), human-caused damage (such as the results of OHV recreation or camping on archeological sites), or illegal collecting. Loss of a cultural resource is defined as the physical destruction of the integrity of the resource. The criteria of NRHP significance are dependent upon integrity. Degradation occurs when changes to cultural properties' significance or preservation value occurs.

Potential beneficial impacts to cultural resources are likely to occur as a result of BLM special designations. Management guidance and directions for the designated WA and ACECs would provide benefits to cultural resources from restricting certain degrading activities and practices. Heritage sites that are located within ACECs would have additional protection from impacts that could be caused by mineral resource activities. The WA within the Planning Area is statutorily closed to motorized equipment, mechanized transport use, and withdrawn from mineral entry, except valid existing rights. These restrictions result in fewer visitations and fewer adverse impacts to heritage resources from visitation.

Any ground-disturbing activity has the potential to cause the loss and/or degradation of archaeological sites or other cultural resources. For example, vegetation management and treatment methods typically have detrimental effects on heritage resources; however, these interactions are complex. Eliminating invasive plant species and the fuel load near heritage sites could result in beneficial effects by reducing the chance of wildfire impacting these sites.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Impacts to cultural resources associated with geothermal development could include the loss and/or degradation of archaeological sites or other cultural resources.

Wildlife improvements in the Planning Area mainly consist of wildlife guzzler projects. Wildlife guzzlers tend to alter travel patterns and concentrate wildlife in areas. Destruction, trampling, or displacement of surface artifacts may result from concentrated use, causing loss of context, or loss of features.

Direct impacts from fire and fire suppression activities could result in the damage or destruction of sites and associated artifacts; destruction of organic materials such as bone, plant, and animal fibers, and wooden elements; and destruction or chemical alteration of materials used to date sites, such as charcoal.

Mineral resource actions, including sand and gravel and geothermal leasing, result in surface disturbance activities that could cause the destruction and/or degradation of cultural resources.

Unauthorized cross-country travel could inadvertently damage sites from surface disturbance or provide vehicular access to previously remote areas, which may result in artifact collection, breakage, displacement, vandalism, and illegal artifact collection.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Impacts to cultural resources associated with solar and wind energy development could include the loss and/or degradation of archaeological sites or other cultural resources.

Discretionary and construction actions, such as road building, ROWs, mineral activities, renewable energy development, and certain recreational activities, such as OHV recreation, would involve ground-disturbing actions that could cause the destruction and/or degradation of cultural resources, particularly if the resource was subsurface and previously undetected. These activities could also result in the discovery of an otherwise undetectable resource and would undergo Section 106 consultation during the site-specific NEPA analysis and documentation conducted to authorize the site-specific action.

Land acquisitions provide additional management consideration and protection of cultural resources in the Planning Area. Land acquisition would have a beneficial effect on any cultural resources that exist within the acquired property.

4.9.2 Differences between Alternatives

There should be little difference between alternatives in terms of direct impacts to cultural resources because these impacts would be avoided or otherwise mitigated pursuant to the NHPA, NEPA, and other federal mandates. There may be some differences, however, with regard to indirect loss or degradation because alternatives vary in the sizes of protection-oriented management decisions. The primary differences among the alternatives would be the acreage made available to geothermal leasing, OHV recreation, solar and wind energy development (see Table 4-1). Any authorized action would have low to no potential for adversely impacting cultural resources, and the actions of other agencies would be in compliance with Section 106. In general terms, reducing the levels of these activities also reduces the likelihood of adverse impacts to cultural resources.

The following discussion provides a ranking based on their potential for ground disturbance (see Table 4-1). Under this ranking, the assessment of the relative potential of an alternative to affect cultural resources is based on the premise that the greater the degree of access for OHV recreation and the greater the area of potential ground disturbance, the greater the potential would be for adverse effects. Due to limitations in the existing data, this approach does not take into consideration resource significance, site type and complexity, or variations in resource densities.

Impacts to cultural resources from geothermal leasing would vary by alternative. Under Alternatives 1, 2, and 7, the majority of the Planning Area, 188,426 acres, would be available for geothermal leasing and, in turn, potential adverse impacts to cultural resources would be greater. Under these alternatives, there would be increased potential for destruction and/or degradation of cultural resources due to geothermal construction and development activities within the Planning Area (see Table 4-1). Geothermal leasing would have the lowest potential adverse impacts under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8). Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 188,426 acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area, where cultural resources may occur. Under Alternatives 5 and 6, geothermal leasing would be limited to 11,939 acres within the Planning Area (see Table 4-1 and Map 2-10). Under Alternative 8, geothermal leasing would be limited to 35,115 acres with 136,691 acres of NSO stipulation. Under Alternatives 5, 6, and 8 adverse impacts to

cultural resources would be concentrated in a relatively small portion of the Planning Area (five to 16 percent).

OHV area designations would have the highest level of potential adverse impacts to cultural resources under Alternative 1. Under this alternative, the majority of the Planning Area, excluding the WA (26,098 acres), would be open or limited OHV recreation, increasing the potential for destruction and/or degradation of cultural resources from OHV recreation activities. Under Alternatives 7 and 8, adverse impacts would be similar to those under Alternative 1; however, 36,743 and 35,144 acres, respectively, would be closed to OHV recreation under these alternatives, protecting 10,645 and 9,046, respectively, more acres than Alternative 1. Under Alternatives 2 and 3, the greatest number of acres (75,322 and 87,778 acres, respectively) would be closed to OHV recreation. Motorized travel would not be authorized within proposed closed OHV management areas, destruction and/or degradation of cultural resources from OHV recreation would no longer occur. Under Alternatives 4, 5, and 6, adverse impacts to cultural resources would be greater than under Alternatives 2 and 3 but less than under Alternatives 1, 7, and 8 (see Table 4-1).

Under Alternatives 1, 2, and 7, lands available for solar and wind leasing would be the highest, resulting in greater potential adverse impacts to cultural resources. Under these alternatives, 188,833 acres would be available for solar and wind development, except the WA (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential destruction and/or degradation of cultural resources. Under Alternatives 3 and 8, only 47,131 and 35,115 acres, respectively, would be available for solar and wind lease and development (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36), resulting in a lower potential for destruction and/or degradation of cultural resources. Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas. An avoidance area is defined as an area only available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization. Cultural resources may be adversely impacted under these alternatives if solar and wind energy proposals have no other reasonable location. Under these alternatives, the WA would continue to be excluded.

4.9.3 Unavoidable Adverse Impacts

Unavoidable adverse impacts on cultural resources could occur as a result of natural events (e.g., wildfire, floods). These would primarily affect known sites and/or areas with high potential for cultural properties.

Climate changes, including extended drought cycles, could increase the potential for unavoidable adverse impacts to cultural properties.

4.9.4 Cumulative Impacts

Incremental loss of cultural resources would continue due to natural processes and inadvertent or intentional damage from casual use and various recreational activities (e.g., OHV recreation, camping). Important cultural resource sites tend to overlap with established ROW corridors and popular recreation destinations. Cumulative impacts to cultural resources may occur due to an increase in demand for multiple uses within areas that are known to contain important cultural resource values.

Together, all of the developments that are currently proposed within the Planning Area cumulatively affect the visual setting and integrity of feeling for cultural resources on BLM lands. Major ROWs, particularly power line corridors or renewable energy developments, have an effect on the viewsheds for important cultural sites on the landscape. Future developments, including energy and transportation ROWs, material pits, and community expansion, have the potential to directly impact, damage, or destroy cultural resources. The net loss of these cultural resources from development affects the overall cultural resource values of the landscape. Any actions by BLM, other federal agencies, or project proponents that occur on federal lands would require compliance with Section 106 of the NHPA, requiring an analysis of potential impacts to cultural resources.

4.10 Impacts on Paleontological Resources

Potential paleontological resources within the Planning Area would be susceptible to impacts from vegetation treatments, mining and mineral extraction activities, recreation, OHV/transportation uses, land use authorizations, and land tenure decisions. These impacts could lead to the disturbance, destruction, or loss of paleontological resources. Protective land use designations such as the WA, ACECs, and closed OHV management areas would have coincidental beneficial impacts by protecting known and unknown paleontological resources. Any BLM-authorized action would have low to no potential for impacting paleontological resources within the Planning Area.

4.10.1 Loss or Degradation of Paleontological Resources

Loss or degradation of vertebrate fossils and scientifically significant invertebrate resources could occur from natural or human-caused deterioration, or potential conflict with other resource uses.

Ground- and subsurface-disturbing activities would have the potential to cause the inadvertent loss and/or degradation of vertebrate fossils and scientifically significant invertebrate resources. Discretionary and construction actions, such as mineral

activities, recreational facilities, road building, and ROWs, would involve excavation or ground disturbance that could cause the inadvertent loss and/or degradation of vertebrate fossils and scientifically significant invertebrate resources. These activities could also result in the discovery of an otherwise undetected resource.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Impacts to paleontological resources associated with geothermal development could include the loss and/or degradation of vertebrate fossils and scientifically significant invertebrate resources.

Loss or degradation of vertebrate fossils and scientifically significant invertebrate resources would be minimal in the WA and ACECs designated to protect sensitive resource values. Exclusion and avoidance areas would help to direct projects into areas that would have reduced impact on vertebrate fossils and scientifically significant invertebrate resources. The management objectives of VRM classes I and II strive to preserve or retain the existing characteristic landscape, so they could provide coincidental benefits to vertebrate fossils and scientifically significant invertebrate resource sites.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), as well as ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Impacts to paleontological resources associated with solar and wind energy development could include the loss and/or degradation of vertebrate fossils and scientifically significant invertebrate resources.

Land acquisitions provide additional management consideration and protection of vertebrate fossils and scientifically significant invertebrate resources in the Planning

Area. Land acquisition would have a beneficial effect on any vertebrate fossils and scientifically significant invertebrate resources that exist within the acquired property.

4.10.2 Differences between Alternatives

Differences in impacts to vertebrate fossils and scientifically significant invertebrate resources would potentially vary by alternative as the amount of surface disturbance varies. Alternatives providing more acreage for OHV recreation, camping, construction activities, as well as renewable energy and geothermal leasing activities would result in greater adverse impacts (see Table 4-1). Differences in impacts to vertebrate fossils and scientifically significant invertebrate resources by alternative would be similar to those outlined in Section 4.9.2 for Cultural Resources above.

4.10.3 Unavoidable Adverse Impacts

Unavoidable adverse impacts on vertebrate fossils and scientifically significant invertebrate resources could occur as a result of natural events.

4.10.4 Cumulative Impacts

Cumulative impacts to paleontological resources may occur through natural processes and inadvertent or intentional damage from OHV recreation, casual use mineral exploration, and recreational collecting of common invertebrate and plant fossils. An increase in renewable energy development has the potential to adversely impact paleontological resources. Any actions by other agencies would require compliance with NHPA Section 106, requiring an analysis of potential impacts to paleontological resources. The potential effects of renewable energy development would be analyzed at the time it is proposed. BLM would attempt to prevent or mitigate impacts to paleontological resources, and especially "important" paleontological resources.

4.11 Impacts on Visual Resources

This section provides a discussion of the methodology and criteria used to assess impacts to visual resources that could occur as a result of implementing the DRAMP alternatives. The assessment of impacts would utilize the Visual Contrast Rating component of the BLM's VRM System.

The BLM's responsibility to manage the scenic resources of public lands is established by both FLPMA and NEPA. The overall goal of the BLM's VRM system is to minimize visual impacts and ensure that mitigation measures are applied to potentially adverse visual impacts. The Visual Contrast Rating System is a formal process utilized by BLM to identify and analyze the potential visual impacts of projects and management-related

activities. The basic analysis in this rating system focuses on the degree to which a project impacts the visual quality of an area. This depends on the visual contrast created between a given surface-disturbing activity and the existing landscape. Visual contrast is measured by comparing the features of the project or activity with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and describe the resulting visual contrast.

The analysis of potential impacts to visual resources was based on review of existing literature and the expertise of BLM resource specialists at the ECFO. Literature sources include but are not limited to the following:

- BLM Manual Section 8400—Visual Resource Management. It is BLM's policy that it has a basic stewardship responsibility to identify and protect visual values on all BLM lands. The manual provides specific direction in inventorying, evaluating, and determining impacts to visual resources.
- Information Bulletin No. 98-135
- Instruction Memorandum No. 98-164.
- Instruction Memorandum No. 2000-096 (Use of Visual Resource Management Class I Designation in WSAs)

Visual resource impacts are measured in terms of the level of contrast in form, line, texture, and color in the landscape that result from a land-disturbing activity. The level of acceptable contrast or change to the characteristic landscape ranges from minimal to high, depending on the location. The DRAMP alternatives would establish landscape management classes ranging from Class I to IV, and all proposed projects/activities would adhere to the VRM class objectives as described in Chapter 2, Section 2.2.11

Impacts from management actions and decisions would in effect be self-mitigating, in that their final approval would be based on meeting the visual quality objectives of the VRM class in which they take place. Design guidelines to avoid, minimize, or reduce visual impacts are included in Appendix C.

4.11.1 Loss and Degradation of Visual Resources

Adverse impacts to visual resources from air quality (e.g., low visibility due to dust or smoke) would be temporary. Vegetation treatment activities (e.g., management of non-native and invasive species) could result in short-term adverse impacts to visual resources through the temporary loss of vegetative cover. Once desired vegetation objectives are achieved, however, adverse impacts to VRM would be minimized or eliminated. Vegetative treatments would generally be implemented to restore or enhance the natural conditions of the public lands, and would have beneficial impacts to visual

resources independent of VRM designations. Restoration and/or enhancement of natural conditions would contribute to scenic quality by reducing visual contrast from pre-restoration conditions.

Wildlife enhancement activities (e.g., wildlife guzzlers) could result in an adverse alteration to the visual landscape unless designed to blend in with the surrounding landscape. Indirect beneficial effects would include wildlife viewing opportunities.

Protection of cultural resources and special designations (ACECs and the WA) could have indirect beneficial effects on visual resources to the extent that ground-disturbing activities would be minimized. The management activities allowed in ACECs would be protective in nature and, as such, would be beneficial to visual resources. The existing WA would continue to be managed under VRM class I objectives.

The viewsheds of important cultural resources would be maintained when the settings significantly contribute to the resources' scientific, public, traditional, or conservation values. This management approach to cultural resources within the Planning Area would also have concurrent beneficial impacts to visual resources. Avoiding surface impacts and maintaining viewsheds would contribute to visual quality and enhance visitor experience by retaining natural conditions and not increasing visual contrast levels.

Potential VRM classifications (see Section 2.3.11, Visual) vary by alternative and reflect management strategies that place a higher or lower priority on preserving or retaining the existing character and scenic quality of the landscape.

Mineral resource activities would be expected to have an adverse impact on visual resources within the viewshed of the activity (e.g., sand and gravel pit, geothermal facility).

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Impacts to visual resources associated with geothermal development could include the degradation of sensitive viewsheds.

Facility development associated with recreation and visitor services (buildings, signs, structures, and associated infrastructure) could have an adverse impact on visual resources, as could expansive, high-density RV camping. Unattended trash and windblown debris would detract from the scenic quality of the environment and result in adverse impacts on visual resources. Periodic diminishment of dark night skies resulting

from night-time OHV recreation could adversely impact desired visitor visual experience of the night skies.

Recreationists would continue to congregate at the popular areas during peak-use times (i.e., major holiday weekends). Due to anticipated increases in visitation, the visual resources of the landscape during peak periods would appear more crowded at the popular areas when compared to baseline conditions. Increased visitation during peak-use periods would result in temporary (episodic) landscape changes. When the peak-use periods end, use levels and associated visual resources would return to a condition that would be similar to the baseline condition.

Visitor perception of scenic quality could be adversely impacted at times of high-volume vehicular use. Residual evidence of vehicular use, such as visible tracks in the sand dunes or on the routes, would have a temporary adverse impact on visitor perception of scenic quality.

Within designated closed OHV areas, no motorized travel is allowable. Visual resources would be maintained or enhanced within the proposed closed OHV management areas.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Impacts to visual resources associated with solar and wind energy development could include the degradation of sensitive viewsheds.

Lands and realty decisions that could have an adverse impact to visual resources include: ROW use and development; utility transmission infrastructure; renewable energy sites and associated structures; and communication facility sites and associated structures.

4.11.2 Differences between Alternatives

Differences in impacts to visual resources would vary by alternative. Table 2-7 depicts the number of acres that each alternative would designate to the four VRM classes.

Under all alternatives, the WA would be designated as class I. Under Alternative 1, VRM classes were determined based on associated multiple-use classes as assigned under the 1980 CDCA Plan. VRM classes would be the same under Alternatives 2, 4, 5, 6, and 8 (Table 2-7). Under Alternative 3, the highest number (173,794 acres) of VRM class II acres and the lowest number (0 acre) of VRM class IV acres are proposed.

Under Alternative 7, the lowest number (16,031 acres) of VRM class II and highest number (84,094 acres) of VRM class IV acres are proposed. Alternatives 1 and 7 reflect a management strategy that would place a lower priority on preserving or retaining the existing character and scenic quality of the landscape than under Alternative 3. Alternatives 2, 4, 5, 6, and 8 reflect a moderate level priority and preservation for visual resources (see Table 2-7.)

The following sections discuss visual impacts first by Visual Resource Management Classes and potential for resource use, and secondly by comparing the respective VRM classes to the Inventory Classes.

4.11.2.1 Potential Impacts to VRM Classes

Alternatives providing more acreage for OHV recreation, camping, construction activities, as well as geothermal leasing activities and renewable energy development would result in greater adverse impacts to visual quality. Table 4-7 depicts the number of acres that each alternative would designate to the four VRM classes, segregated by resource or resource uses with the highest potential to impact visual quality.

Impacts to visual resources from geothermal leasing would vary by alternative. Under all alternatives, the WA under VRM class I would not be available for geothermal development.

Under Alternatives 1 and 2, 71,598 acres and 104,739 acres of VRM class II, respectively, would be available for geothermal leasing and potential adverse impacts to viewsheds would be greater. Under these alternatives, there would be increased potential for the loss of visual quality due to geothermal construction and development activities within VRM class II areas (Table 4-7). Geothermal leasing would have the lowest potential adverse impacts to visual resources under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Table 4-7 and Map 2-8). Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 104,739 of VRM class II acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area, where the view from the Planning Area may be adversely impacted. Under Alternatives 5 and 6, geothermal leasing would be limited to 5,088 acres of VRM class II within the Planning Area (Table 4-7 and Map 2-10). Adverse

TABLE 4-7
POTENTIAL IMPACTS TO VISUAL RESOURCE MANAGEMENT CLASSS BY ALTERNATIVE (ACRES)

VRM Class	Alternative							
	1	2	3	4	5	6	7	8
Mineral Resources—Land Available for Geothermal Leasing (acres)								
I	0	0	0	0	0	0	0	0
II	71,758	104,739	0	0	5,088	5,088	16,031	3,190
III	37,782	69,055	0	0	5,040	5,040	88,708	30,058
IV	28,571	15,039	0	0	1,811	1,811	84,094	1,867
Mineral Resources—Land Not Available for Geothermal Leasing (acres)								
I	26,098	26,098	26,098	26,098	26,098	26,098	26,098	26,098
II	0	0	173,794	0	99,651	99,651	0	95,670
III	0	0	15,039	0	64,015	64,015	0	31,267
IV	0	0	0	0	13,228	13,228	0	12,755
Mineral Resources—Land Available but with NSO for Geothermal Leasing (acres)								
I	0	0	0	0	0	0	0	0
II	0	0	0	104,739	0	0	0	5,878
III	0	0	0	69,055	0	0	0	7,730
IV	0	0	0	15,039	0	0	0	417
Recreation—OHV Open (acres)								
I	0	0	0	0	0	0	0	0
II	66,150	53,563	62,283	71,899	69,132	73,798	4,260	86,376
III	35,202	21,486	12,393	21,249	22,012	22,335	80,431	28,268
IV	19,041	12,664	0	12,695	12,695	12,782	41,019	12,773
Recreation—OHV Closed (acres)								
I	26,098	26,098	26,098	26,098	26,098	26,098	26,098	26,098
II	0	41,908	61,291	22,047	26,204	21,539	5,652	9,037
III	0	7,197	389	6,988	6,225	5,903	4,993	0
IV	0	119	0	87	87	0	0	9
Recreation—OHV Limited (acres)								
I	0	0	0	0	0	0	0	0
II	5,608	9,268	50,221	10,793	9,403	9,403	6,119	9,326
III	2,580	40,372	2,257	40,818	40,818	40,818	3,284	40,787
IV	9,530	2,256	0	2,257	2,257	2,257	43,075	2,257
Lands and Realty—Renewable Energy (Solar and Wind) Available (acres)								
I	0	0	0	0	0	0	0	0
II	71,758	104,739	45,226	3,419	3,419	3,419	16,031	3,190
III	37,782	69,055	1,905	34,883	34,883	34,883	88,708	30,058
IV	28,571	15,039	0	1,392	1,392	1,392	84,094	1,867
Lands and Realty—Renewable Energy (Solar and Wind) Avoidance (acres)								
I	n/a	n/a	n/a	0	0	0	0	0
II	n/a	n/a	n/a	99,905	99,905	99,905	n/a	0
III	n/a	n/a	n/a	30,739	30,739	30,739	n/a	0
IV	n/a	n/a	n/a	13,645	13,645	13,645	n/a	0
Lands and Realty—Renewable Energy (Solar and Wind) Excluded (acres)								
I	26,098	26,098	26,098	26,098	26,098	26,098	26,098	26,098
II	0	0	128,568	1,415	1,415	1,415	0	101,549
III	0	0	13,133	3,432	3,432	3,342	0	38,997
IV	0	0	0	1	1	1	0	13,171

impacts to visual resources would be concentrated in a relatively small portion of the Planning Area (two percent). Under Alternatives 7 and 8, there would be 16,031 and 3,190 acres of VRM class II available for geothermal leasing. Adverse impacts to visual resources within VRM class II would be similar to those for Alternatives 5 and 6, covering a relatively small portion of the planning area overall (between 1 and 7 percent).

Under all alternatives, the WA (26,098 acres) under VRM class I would be closed to OHV recreation. OHV area designations would have the highest level of potential adverse impacts to visual resources under Alternative 1. Under this alternative, no acres within the Planning Area would be closed (0 acre) to OHV recreation within VRM class II, increasing the potential for adverse impacts to visual quality and viewsheds from OHV recreation activities. Under Alternative 2, 19 percent of the Planning Area would be closed (41,908 acres) to OHV recreation within VRM class II, resulting in low to moderate adverse impacts to visual quality and viewsheds from OHV recreation activities. Under Alternative 3, 28 percent of the Planning Area would be closed (61,291 acres) to OHV recreation in VRM class II, resulting in low adverse impacts to visual quality and viewsheds from OHV recreation activities. Alternatives 4, 5, and 6 may result in low potential adverse impacts to visual quality and viewsheds within VRM class II. Under these alternatives, 10 to 12 percent of the Planning Area would be closed to OHV recreation within VRM class II. Alternatives 7 and 8 would close 3 to 4 percent of the Planning Area, respectively, of VRM class II to OHV recreation, resulting in similar adverse impacts as those for Alternative 1 (Table 4-7).

Under Alternatives 1 and 2, lands available for solar and wind leasing under VRM class II would be the highest, resulting in greater potential adverse impacts to visual resources (Table 4-7). Under these alternatives, 71,758 and 104,739 acres, respectively, would be available for solar and wind development (Table 4-7, Maps 2-29 and 2-33), resulting in potential adverse impacts to visual quality and viewsheds. Under Alternatives 1 and 2, there would be no avoidance or exclusion acres for solar and wind energy development. Under Alternative 3, a total of 45,226 acres would be available and 128,568 acres of VRM class II would be excluded from solar and wind lease and development (Table 4-7 and Maps 2-30 and 2-34) resulting in lower potential adverse impacts to visual quality and viewsheds overall. Under this alternative there would be no avoidance acres for solar and wind energy development. Under Alternatives 4, 5, and 6, there would be 3,419 acres available, 99,905 acres designated as avoidance areas, and 1,415 acres excluded in VRM class II, resulting in moderate to high potential adverse impacts depending on avoidance area development. Under Alternative 7, 16,031 acres within VRM class II would be available for development, potentially resulting in moderate adverse impacts to visual quality and viewsheds. Under Alternative 7 there would be no avoidance or exclusion acres for solar and wind development for VRM class II. Under Alternative 8, a total of 3,190 acres would be available, and 101,549 acres would be excluded from solar and wind development. Under this alternative there would be no

avoidance acres. Adverse impacts to VRM class II from this alternative would be the lowest of the alternatives overall. An avoidance area is defined as an area only available for discretionary land use authorizations, when there are no other reasonable alternatives for the authorization. Visual resources may be adversely impacted under these alternatives, if solar and wind energy proposals have no other reasonable location.

4.11.2.2 Potential Impacts to Visual Inventory Classes

Generally, alternatives with a low correlation between the VRM classes and the Visual Resource Inventory (VRI) classes would result in greater adverse impacts to visual quality. Conversely, impacts would most likely be minimized by alternatives proposing visual management that either closely corresponds to the VRI classes, or proposes a more restrictive (higher) class designation. Table 4-8 below quantifies VRM class designation impacts to Visual Resource Inventory values by alternative.

Alternative 1, the No Action Alternative, would designate 100 percent of VRI class I as VRM class I, as do all other alternatives. This Alternative would designate 50 percent of VRI class II as VRM class II, but would designate the remainder of VRI class II lands as VRM class III and IV, in effect lowering the restrictiveness of standards and objectives by which these lands (approximately 46,000 acres) would be managed. Conversely, it would designate approximately 18,800 acres of VRI class III as VRM class II, and designate approximately 6,600 acres of VRI class IV as VRM class III, in effect raising the restrictiveness of standards and objectives by which these lands (approximately 25,000 acres) would be managed. When compared to the inventoried values, the potential for impacts to VRI class II lands increase, while the potential for impacts to VRI class III and IV decrease. This reflects current management under the 1980 CDCA Plan.

As shown in Table 4-8, VRM class designations proposed by Alternatives 2, 4, 5, 6, and 8 have the highest correlation to the VRI classes. Each of these alternatives would designate 100 percent of VRI class I as VRM class I; 99 percent of VRI class II as VRM class II; 90 percent of VRI class III as VRM class III, and 99 percent of VRI class IV as VRM class IV. Therefore these alternatives would result in a very high level of retaining the integrity of the inventoried values, and consequently, the lowest levels of potential visual impact to those values.

Alternative 3 also proposes a high correlation to VRI classes I and II (100 percent and 99 percent respectively). Additionally, this alternative would designate 99 percent of the VRI class III lands as VRM class II, and 99 percent of the VRI class IV lands as VRM class III, in effect raising the restrictiveness of standards and objectives by which these lands (approximately 89,000 acres) would be managed. Therefore this alternative would result in the highest level of retaining the integrity of the inventoried values, and consequently, the lowest level of potential visual impact of all alternatives.

TABLE 4-8
COMPARISON OF VISUAL MANAGEMENT CLASSES WITH INVENTORY CLASSES BY ALTERNATIVE (ACRES)

VRM Management Class Designations (acres)		Visual Resource Inventory Class Designations (acres)								
		VRI Class I (acres)		VRI Class II (acres)		VRI Class III (acres)		VRI Class IV (acres)		Total (acres)
		26,098	**%**	**98,640**	**%**	**76,466**	**%**	**13,727**	**%**	**214,930**
Alternative 1										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26,098
VRM II	71,758	0	0	49,777	**50**	18,806	25	3,175	23	71,758
VRM III	37,782	0	0	29,608	30	4,783	**6**	3,391	25	37,782
VRM IV	28,571	0	0	15,971	17	6,992	9	5,608	**41**	28,571
Total	164,209	26,098	100	95,356	97	30,581	40	12,174	89	164,209
Alternative 2										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26,098
VRM II	104,739	0	0	97,920	**99**	6,624	9	195	1	104,739
VRM III	69,055	0	0	41	0	69,014	**90**	0	0	69,056
VRM IV	15,039	0	0	679	1	828	1	13,532	**99**	15,039
Total	214,930	26,098	100	98,640	100	76,466	100	13,727	100	214,930
Alternative 3										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26,098
VRM II	173,794	0	0	97,961	**99**	75,638	99	195	1	173,794
VRM III	15,039	0	0	679	1	828	**1**	13,532	99	15,039
VRM IV	0	0	0	0	0	0	0	0	**0**	0
Total	214,930	26,098	100	98,640	100	76,466	100	13,727	100	214,930
Alternative 4										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26,098
VRM II	104,739	0	0	97,920	**99**	6,624	9	195	1	104,739
VRM III	69,055	0	0	41	0	69,014	**90**	0	0	69,056
VRM IV	15,039	0	0	679	10	828	1	13,532	**99**	15,039
Total	214,930	26,098	100	98,640	100	76,466	100	13,727	100	214,930

TABLE 4-8
COMPARISON OF VISUAL MANAGEMENT CLASSES WITH INVENTORY CLASSES BY ALTERNATIVE (ACRES) (CONT.)

VRM Management Class Designations (acres)		Visual Resource Inventory Class Designations (acres)								
		VRI Class I (acres)		VRI Class II (acres)		VRI Class III (acres)		VRI Class IV (acres)		Total (acres)
		26,098	**%**	**98,640**	**%**	**76,466**	**%**	**13,727**	**%**	**214,930**
Alternative 5										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26098
VRM II	104,739	0	0	97,920	**99**	6,624	9	195	1	104,739
VRM III	69,055	0	0	41	0	69,014	**90**	0	0	69,056
VRM IV	15,039	0	0	679	1	828	1	13,532	**99**	15,039
Total	214,930	26,098	100	98,640	100	76,466	100	13,727	100%	214,930
Alternative 6										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26098
VRM II	104,739	0	0	97,920	**99**	6,624	9	195	1	104,739
VRM III	69,055	0	0	41	0	69,014	**90**	0	0	69,056
VRM IV	15,039	0	0	679	1	828	1	13,532	**99**	15,039
Total	214,930	26,098	100	98,640	100	76,466	100	13,727	100	214,930
Alternative 7										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26,098
VRM II	16,031	0	0	9,248	**9**	6,588	9	195	1	16,031
VRM III	88,708	0	0	88,672	90	36	**0**	0	0	88,708
VRM IV	84,094	0	0	720	1	69,842	91	13,532	**99**	84,708
Total	214,930	26,098	100	98,640	100	76,466	100	13,727	100	214,930
Alternative 8										
VRM I	26,098	26,098	**100**	0	0	0	0	0	0	26098
VRM II	104,739	0	0	97,920	**99**	6,624	9	195	1	104,739
VRM III	69,055	0	0	41	0	69,014	**90**	0	0	69,056
VRM IV	15,039	0	0	679	1	828	1	13,532	**99**	15,039
Total	214,930	26,098	100	98,640	100	76,466	100	13,727	100	214,930

Table shows what the difference is between Inventoried values (Inventory Class) versus what each alternative proposes for management (Management Class). Each alternative will have the same amount of VRI Class I as VRM Class I. **Bold figures** indicate the degree to which VRM classes correlate with VRI classes. For example, in Alternative 7, 99% of the lands assigned VRI class IV are proposed for management as VRM class IV, whereas 0% of the VRI class III lands is proposed for management as VRM class III. Percentages are rounded to the closest whole number.

Alternative 7 proposes a high correlation to VRI classes I and IV (100 percent and 99 percent respectively). However, this alternative would designate 90 percent of the VRI class II lands as VRM class III, and 91 percent of the VRI class III lands as class IV, in effect lowering the restrictiveness of standards and objectives by which these lands (approximately 159,000 acres) would be managed. Therefore this alternative would result in the lowest level of retaining the integrity of the inventoried values and, consequently, the highest level of potential visual impact of all alternatives.

4.11.3 Unavoidable Adverse Impacts

Unavoidable adverse impacts would potentially occur as a result of uncontrollable natural events that create visual contrast levels exceeding the visual quality objectives of a given land area. Such events and the resulting impacts are beyond the scope of this analysis, because they are not related to DRAMP decisions. Unavoidable impacts would potentially occur as a result of non-discretionary activities on BLM-administered lands.

Law enforcement or emergency search and rescue activities, including USBP activities, could result in unavoidable adverse impacts to the scenic quality and visitor experience.

Operational activities of the Mesquite Regional Landfill have the potential to significantly increase truck traffic volumes within the Planning Area, thereby adversely affecting the scenic quality, and would be considered an unavoidable adverse impact. The All-American Canal lining project, the Drop 2 Reservoir project, and the UPRR double track project are unavoidable adverse impacts on the visual environment.

4.11.4 Cumulative Impacts

Impacts on private or other lands that have more lenient visual quality objectives than adjacent BLM-administered lands would potentially result in cumulative impacts to visual resources and visitor experience on BLM-administered lands in the Planning Area. Law enforcement or emergency search and rescue activities, including USBP activities, could result in cumulative impacts to the scenic quality and visitor experience.

Several utility corridors are located within or adjacent to the Planning Area; their associated structures could have an adverse cumulative effect on the visual landscape. Operational activities of the Mesquite Regional Landfill have the potential to significantly increase truck traffic volumes within the Planning Area, thereby adversely affecting the scenic quality, and would be considered a cumulative impact. The All-American Canal lining project, the Drop 2 Reservoir project, and the UPRR double track project contribute to cumulative impacts on the visual environment.

4.12 Impacts on Special Designations

Impacts on WAs are those actions that reduce or enhance the wilderness characteristics of naturalness and opportunities for solitude or primitive forms of recreation. Impacts on ACECs are those actions that reduce the relevance and importance values of natural and cultural resources. These characteristics and values could be impacted by the use of motor vehicles and installation of structures causing surface disturbance and evidence of the human-caused modifications of the area.

Dust and erosion control measures could promote the natural desert experience within the WA and designated ACECs. Wilderness and ACEC values could be impacted by vegetation treatments (e.g., chemical and mechanical) for non-native invasive plant species removal. Restoration of previously disturbed areas could improve wildlife habitat and reduce instances of illegal incursion within the ACECs and WA.

Construction and maintenance of wildlife guzzlers could promote wildlife habitat, but construction of permanent human-made facilities would degrade wilderness values. Any closures resulting from special status species management could enhance the protection for the WA and ACEC values.

Cultural and natural resource interpretation could increase public awareness of sensitive resource values within the ACECs. Visual resource management could increase scenic quality values of the WA and ACECs. Special designation management actions would protect ACEC relevance and importance values.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Geothermal development could adversely impact ACECs by reducing the characteristics of relevance and importance, and potentially disturb natural and cultural resources.

Sensitive cultural and ecological resources would be protected by a NSO stipulation for leasables and renewable energy authorizations. ROW construction and use (including utility infrastructure and communication sites) and any other land uses could impact ACEC relevance and importance values. Adverse impacts would be minimized through BLM-required mitigation measures and BMP. Acquisition of inholdings would protect ACEC relevance and importance values by adding acquired lands under protective management of the special designation area.

Potential adverse impacts from recreational activities (e.g., OHV recreation) would include disturbance of sensitive cultural or biological resources. Potential adverse impacts could occur from OHV recreation along routes of travel within ACECs. Impacts could include disturbance, erosion, loss of vegetation, potential wildlife mortality resulting from vehicle encounters, and increased visitation to sensitive resource areas (including cultural and wildlife). Interpretive materials and programs related to wilderness values and ACEC relevance and importance values could have a beneficial impact on land use ethics employed by visitors during their stay. Transportation and public access reductions, depending upon alternative, could increase trespass within the WA and ACECs.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Solar and wind development could adversely impact ACECs by reducing the characteristics of relevance and importance, and result in disturbance to natural and cultural resources.

4.12.1 Differences between Alternatives

Differences in impacts to special designations would potentially vary by alternative. Alternatives providing more acreage for OHV recreation, camping, construction activities, as well as renewable energy and geothermal leasing activities would result in greater adverse impacts (Table 4-9).

TABLE 4-9
POTENTIAL IMPACTS TO SPECIAL DESIGNATIONS BY ALTERNATIVE (ACRES)

Designation	Alternative							
	1	2	3	4	5	6	7	8
Mineral Resources—Land Available for Geothermal Leasing (acres)								
East Mesa ACEC	6,454	6,454	0	0	0	0	5,802	0
Plank Road ACEC	298	298	0	0	0	0	298	0
North Algodones Dunes ACEC	854	854	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	0	0	0	0	0	0	0
Mineral Resources—Land Not Available for Geothermal Leasing (acres)								
East Mesa ACEC	0	0	5,802	0	5,802	5,802	0	0
Plank Road ACEC	0	0	298	0	298	298	0	298
North Algodones Dunes ACEC	24,851	n/a	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	26,098	26,098	26,098	26,098	26,098	26,098	26,098
Mineral Resources—Land Available but with NSO for Geothermal Leasing (acres)								
East Mesa ACEC	0	0	0	5,802	0	0	0	5,802
Plank Road ACEC	0	0	0	298	0	0	0	0
North Algodones Dunes ACEC	0	0	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	0	0	0	0	0	0	0
Recreation—OHV Open (acres)								
East Mesa ACEC	67	652	0	0	0	0	0	0
Plank Road ACEC	298	298	298	298	298	298	298	298
North Algodones Dunes ACEC	468	418	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	0	0	0	0	0	0	0
Recreation—OHV Closed (acres)								
East Mesa ACEC	0	0	0	0	0	0	0	0
Plank Road ACEC	0	0	0	0	0	0	0	0
North Algodones Dunes ACEC	24,851	318	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	26,098	26,098	26,098	26,098	26,098	26,098	26,098

TABLE 4-9
POTENTIAL IMPACTS TO SPECIAL DESIGNATIONS BY ALTERNATIVE (ACRES)

Designation	Alternative							
	1	2	3	4	5	6	7	8
Recreation—OHV Limited (acres)								
East Mesa ACEC	6,454	6,454	5,802	5,802	5,802	5,802	5,802	5,802
Plank Road ACEC	0	0	0	0	0	0	0	0
North Algodones Dunes ACEC	385	116	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	0	0	0	0	0	0	0
Lands and Realty—Renewable Energy (Solar and Wind) Available (acres)								
East Mesa ACEC	6,454	6,454	0	0	0	0	5,802	0
Plank Road ACEC	298	298	0	0	0	0	298	0
North Algodones Dunes ACEC	852	852	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	0	0	0	0	0	0	0
Lands and Realty—Renewable Energy (Solar and Wind) Avoidance (acres)								
East Mesa ACEC	0	0	0	5,802	5,802	5,802	0	0
Plank Road ACEC	0	0	0	298	298	298	0	0
North Algodones Dunes ACEC	0	0	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	0	0	0	0	0	0	0	0
Lands and Realty—Renewable Energy (Solar and Wind) Excluded (acres)								
East Mesa ACEC	0	0	5,802	0	0	0	0	5,802
Plank Road ACEC	0	0	298	0	0	0	0	298
North Algodones Dunes ACEC	24,851	318	n/a	n/a	n/a	n/a	n/a	n/a
North Algodones Dunes WA	n/a	26,098	26,098	26,098	26,098	26,098	26,098	26,098

N/a = Applies to the North Algodones Dunes Wilderness ACEC as it overlaps with the North Algodones Dunes Wilderness. BLM strives to manage the area to the highest protection possible and to avoid management regime overlap.

Under all alternatives, the WA (or North Algodones Dunes ACEC under Alternative 1) would be closed to geothermal development. Under Alternatives 1, 2, and 7, the East Mesa ACEC (6,454 acres under Alternatives 1 and 2; 5,802 acres under Alternative 7) and 298 acres of the Plank Road ACEC would be available to geothermal development, potentially resulting in adverse impacts to the natural and cultural values of these areas. Under Alternatives 3, 5, and 6, land within the ACECs would not be available for geothermal development. Under Alternatives 4 and 8, land within the East Mesa ACEC (5,802 acres) would be available for geothermal leasing with no surface occupancy. Under Alternative 4, the Plank Road ACEC would be available for geothermal development with no surface occupancy and under Alternative 8 it would not be available, no adverse impacts to natural and cultural resource values would likely occur under these alternatives (see Table 4-9).

Under all alternatives, the WA (the North Algodones Dunes ACEC under Alternative 1) would be closed to OHV recreation. Under all alternatives, OHV recreation within the East Mesa ACEC would be limited to designated routes (6,454 acres under Alternatives 1 and 2, 5,802 acres under all other alternatives), resulting in reduced potential adverse impacts to natural and cultural resources. Under all alternatives, 298 acres of the Plank Road ACEC would be open to OHV recreation, potentially resulting in disturbance to sensitive natural and cultural resources within the majority of this ACEC (see Table 4-9).

For solar and wind energy, under Alternatives 1, 2, and 7, the East Mesa ACEC (6,454 acres under Alternatives 1 and 2; 5,802 acres under Alternative 7) and 298 acres of the Plank Road ACEC would be available to development. Under Alternatives 3 and 8, no solar or wind energy development would be allowed within the East Mesa or Plank Road ACECs. Under Alternatives 4, 5, and 6, the East Mesa ACEC and Plank Road ACEC would be avoidance areas for solar and wind energy. Under these alternatives, potential adverse impacts to sensitive natural and cultural resources with ACECs may occur if no other reasonable areas for development are found. Under all alternatives, solar and wind development would not be allowed within the WA (North Algodones Dunes ACEC under Alternative 1).

4.12.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts on wilderness values of naturalness and solitude include aircraft, vehicle, and train traffic on neighboring lands, as well as noise related to law enforcement and emergency services activities that occur on SR-78 and roads adjacent to the wilderness. Military and civilian aircraft overflights could adversely impact wildlife resources. Special ground training maneuvers and USBP enforcement could adversely impact cultural and biological resources causing degradation in the relevance and importance values of ACEC areas.

Hazardous material spills (e.g., along I-8 or SR-78, from UPRR derailments) and unauthorized disposal of hazardous materials could have an unavoidable adverse impact to wilderness values and ACEC relevance and importance values.

4.12.3 Cumulative Impacts

In portions of the region, where communities are sustaining substantial growth, requests for land use authorizations would be anticipated to increase and could be in conflict with wilderness values and ACEC relevance and importance values, resulting in cumulative impacts.

4.13 Impacts on Mineral Resources

Impacts to mineral resources would be considered adverse when the alternative would affect the existing or potential future economic production of a mineral resource, either by limiting access to the resource or by degrading the quality of the resource. It would also be an adverse effect when implementation of the alternative would eliminate access to a potential mineral resource that has been determined by a regulating agency to be rare, unique, or regionally significant. Mineral resources would be adversely impacted when planning decisions limit access to or place limitations on the development of valuable mineral deposits.

Social and economic impacts to Mineral Resources are discussed in Section 4.18 of this chapter.

4.13.1 Impacts on Locatable (Metallic and Non-metallic/ Industrial) Minerals

The North Algodones Dunes Wilderness is withdrawn from the operation of the mining and mineral leasing laws under all alternatives. There are no valid rights attendant to mineral resources on public lands that have not been appropriated prior to the WA designation. Adverse impacts to mineral resources would be expected from land use decisions identified in Table 2.11 where access to or availability of mineral resources would be impeded, denied, or restricted, including increased costs associated with restoration of surface disturbance in these areas.

The proposed withdrawal from mineral entry would prohibit access to and development of metallic and non-metallic/industrial minerals for new mineral locations on public lands, and increase costs associated with mitigation and design of access to private mineral interests in these areas. Where mining claims with verified valid existing rights are located in areas withdrawn from mineral entry, and these rights would need to be acquired to protect non-mineral resources, local or regional economies would be

adversely impacted by restricting these metallic and non-metallic/industrial minerals deposits from foreseeable future use.

4.13.2 Impacts on Leasable (Energy) Resources

In the event that an application is proposed for development of leasable resources on BLM-administered lands within the Planning Area, impacts to leasable resource activities would vary by alternative as presented in Table 2.12 and management actions presented in section 2.3.15.5 (Mineral Resources).

4.13.3 Impacts on Salable (Construction) Materials

There is limited potential for future development of salable resources from BLM-administered lands within the Planning Area. In the event that an application is proposed for development of salable resources on BLM-administered lands within the Planning Area, impacts to salable resource activities would vary by alternative and by management actions presented in section 2.3.15.6 (Mineral Resources).

4.13.4 Differences between Alternatives

Differences in impacts to mineral resources would potentially vary by alternative. The primary differences are related to lands available for geothermal leasing (leasable mineral resource; Table 4-1 and Maps 2-7 through 2-11). Under Alternatives 1, 2, and 7, 188,426 acres of the Planning Area would be available and 26,098 acres (the WA) would not be available for geothermal leasing. Under Alternative 3, geothermal leasing would not be allowed (no available acres) within the Planning Area. Under Alternative 4, 188,426 acres would be available for geothermal leasing but with an NSO stipulation, thereby reducing surface disturbing activities within the Planning Area. Under Alternatives 5 and 6, 11,939 acres would be available for geothermal leasing and the remainder of the Planning Area, 202,991 acres, would be unavailable. Under Alternative 8, a total of 35,115 acres would be available and 14,025 acres would be available with an NSO stipulation. The remainder of the Planning Area, 136,691 acres, would be unavailable (see Table 4-1).

Under Alternatives 1 and 2, the ISD SRMA would be maintained (excluding the WA) as open to mineral entry. Under Alternative 3, the ISD SRMA, ACECs, and critical habitat would be proposed for withdrawal from mineral entry. Under Alternatives 4, 5, and 6, ACECs and PMV critical habitat are proposed for withdrawal from mineral entry and the ISD SRMA would be maintained (excluding the WA) as open to mineral entry. Under Alternatives 7 and 8, the ISD SRMA (excluding the WA) and ACECs would be maintained as open to mineral entry.

4.14 Impacts on Recreation Program

According to the BLM Land Use Planning Handbook, land use plan decisions are broad-scale decisions which guide future land management actions and subsequent site-specific implementation decisions. Land use plan decisions identify specific areas of public land or mineral resources where certain uses or management actions are allowed, excluded, or restricted in order to achieve a desired future condition or to protect certain resource values. Land use plan decisions fall into two categories: Goals and Objectives (desired future conditions) and Management Actions (allowable uses) to achieve outcomes.

Implementation decisions constitute the BLM's final approval allowing on-the-ground actions to proceed. These types of decisions require appropriate site-specific planning and NEPA analysis. Implementation decisions may be incorporated into implementation plans (activity or project plans) or may exist as stand-alone decisions.

The recreational resources and activities within the Planning Area could be impacted by management actions pertaining to the following: air resources, soil resources, vegetative resources, wildlife resources, special status species, cultural resources, visual resources, special designations, mineral resources, transportation and public access, lands and realty, and public health and safety. Adverse impacts on recreation primarily occur from management actions related to other resources or resource uses that result in long-term elimination or reduction of recreation opportunities or degradation of the recreation setting and experience (e.g., limited access, development activities, presence of human-made facilities).

Use of dust suppression or means of dust control could benefit the visitor experience. Any dust-control measures that prohibit or restrict vehicular access and recreational activities would reduce those opportunities available in the Planning Area. Any air or soil management actions that could result in recreational restrictions would also reduce the recreational opportunities available in the Planning Area.

Implementing management actions to improve vegetation communities and wildlife habitat could enhance the recreation setting and experience for recreationists seeking natural landscapes. To the extent that those actions restrict motorized use and recreation, OHV recreational opportunities and visitor experience could be diminished. Restrictions on dead and downed wood collection could have an adverse impact on visitor experience.

Management of special status species could affect recreation through habitat improvements and land-use restrictions. Controlling surface-disturbing and disruptive activities to minimize adverse impacts on critical habitat, applying BMP to avoid or reduce habitat fragmentation, and prohibiting surface-disturbing activities within

occupied and suitable habitat would all help to improve ecosystem conditions and the aesthetic values of these areas. Such actions could indirectly enhance the recreation experience for those seeking natural landscapes by improving the setting in which non-motorized recreational activities take place. Such actions, however, could also constrain the development of recreation facilities, as well as diminish OHV recreational experience and opportunity.

Protecting and interpreting cultural and historic resources could enhance the recreational setting and experience for visitors seeking interpretation and knowledge of the cultural resources within the Planning Area. To the extent that these actions would result in closure or reduction of access to areas otherwise available for recreation (e.g., Plank Road ACEC), such actions would diminish OHV recreational experience and opportunity.

Managing visual resources in accordance with individual VRM class objectives would protect, enhance, or diminish the aesthetic values of the recreational setting.

Within the Plank Road ACEC, exposed portions of the Plank Road remnants are closed to access and use. Should additional remnants of the Plank Road be uncovered, these areas could be restricted to access and recreational use. In addition, while there could be educational opportunities, there could also be a loss of OHV recreational opportunity.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a). Areas open to mineral development could allow surface disturbance that could adversely impact the desirability of these areas for recreational use and restrict access. Geothermal development could have an adverse impact on recreational opportunities by reducing public access and altering the aesthetics of the natural landscape. Opportunities for motorized and non-motorized recreationists seeking natural landscapes could also be adversely impacted. Areas available for geothermal leasing but with an NSO stipulation would likely not eliminate recreational opportunities. Areas designated as avoidance would only be available for discretionary land use authorizations when there are no other reasonable alternatives for the authorization. Recreational opportunities would be considered prior to allowing development in avoidance areas.

Increased traffic volume within the Planning Area would have an adverse impact on visitor experience. Acquisition of access routes that are currently held by non-BLM

entities could have a beneficial impact on visitor experience by assuring continued accessibility of recreational resources.

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. Water use would be considerably greater for CSP, however, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Issuing ROWs, leases, and temporary use permits could reduce recreational opportunity if public access were to be restricted (e.g., restricting public access for safety and security reasons near facility infrastructure). Acquisition of lands or easements could enhance recreational opportunity as it could enable more public access and increase the acreage of the Planning Area. Solar and wind energy development could have an adverse impact on recreational opportunities by reducing public access and altering the aesthetics of the natural landscape.

Emergency services, sanitation, law enforcement, and garbage collection may become more intensive management issues as visitation in specific areas increases. Increased public education regarding OHV safety, border issues, UXO, and the risks associated with the desert environment could improve public safety and enhance visitor experience.

4.14.1 Differences between Alternatives

Differences in impacts to recreation would vary by alternative. OHV management area designations by alternative, as depicted in Table 4.1, provide varying levels of opportunities for motorized recreation. Under Alternative 1, 120,393 acres would be designated as open, 26,098 acres (WA) would be designated as closed, and 68,440 acres would be designated as limited OHV management areas. Under Alternative 2, 87,713 acres would be designated as open, 75,322 acres (including the WA) would be designated as closed, and 51,896 acres would be designated as limited OHV management areas. Under Alternative 3, the least number of acres would be designated as open (74,676 acres), the greatest number of acres would be designated as closed (87,778 acres), and 52,478 acres would be designated as limited OHV management areas. Under Alternative 4, 105,843 acres would be designated as open, 55,220 acres (including the WA) would be designated as closed, and 53,868 acres would be

designated as limited OHV management areas. Alternatives 5 and 6 would be similar to Alternative 4. Under Alternative 5, 103,839 acres would be designated as open, 58,614 acres (including the WA) would be designated as closed, and 52,477 acres would be designated as limited OHV management areas. Under Alternative 6, 108,914 acres would be designated as open, 53,539 acres (including the WA) would be designated as closed, and 52,478 acres would be designated as limited OHV management areas. Under Alternative 7, 125,710 acres would be designated as open, 36,743 acres would be designated as closed OHV management (including the WA), and 52,478 acres would be designated as limited OHV management areas. Under Alternative 8, the greatest number of acres would be designated as open OHV management, 127,416 acres, 35,144 would be designated as closed (including the WA), and 52,370 would be designated as limited.

Motorized camping opportunities would be increased or decreased by alternative, depending on the location of closed OHV management areas and campground closures in the microphyll woodlands as well as the Dunebuggy Flats campground closure when rainfall thresholds for PMV are met. The closure of certain OHV management areas would likely result in the displacement of visitors and adversely impact their experience. Potential campground closures would have a direct adverse impact on visitors in areas where overcrowding could occur due to displaced visitor migration within the Planning Area. Other displaced visitors could be more likely to seek alternative recreation opportunities outside the Planning Area. Under Alternatives 1, 2, 4, 5, 6, and 7, camping would continue to be allowed within the microphyll woodlands between SR 78 and I-8, and within the Dunebuggy Flats campground. Under Alternative 3, there would be the potential for campgrounds in the Dunebuggy Flats and Gecko areas to be closed. Under Alternative 8, campgrounds south of Wash 25 and north of Wash 69, as well as the Dunebuggy Flats campground would be closed to camping but open to OHV use.

Facility development could have a beneficial or adverse impact depending on visitor expectation of the recreation experience. Additional facility development could be required, depending on the alternative selected, to accommodate increased visitation or displaced visitors within the Planning Area. Visitor services (e.g., public education, trash collection, emergency services) could increase or decrease depending on the alternative selected and associated revenues generated/lost. Commercial SRPs for vending could be approved or denied depending on opportunities available under the alternative selected (see Section 4.18 Impacts to Social and Economic Setting). Visitor experiences could be enhanced or diminished depending on the availability of vending activities. Under Alternative 8, the closure of the Dunebuggy Flats campground may lead to the need for development of additional recreational facilities in surrounding campgrounds to accommodate displaced visitors.

An increase or decrease in travel routes and public access could enhance or diminish visitor experience, depending on the alternative.

Public health and safety could be more difficult to manage in areas where visitor use increases, depending on the alternative.

Analysis of impacts to the social and economic setting for recreation is found in Section 4.18 of this chapter.

4.14.2 Unavoidable Adverse Impacts

The UPRR fencing project at Wash Road would be an unavoidable adverse impact as it would prohibit access to campgrounds for over 200,000 people per season.

Operational activities of the Mesquite Regional Landfill have the potential to significantly increase truck traffic volumes within the Planning Area, thereby adversely affecting the recreational experience, and would be considered an unavoidable adverse impact.

4.14.3 Cumulative Impacts

Operational activities of the Mesquite Regional Landfill have the potential to significantly increase truck traffic volumes within the Planning Area, thereby adversely affecting the recreational experience, and would be considered a cumulative impact. The UPRR double track project has the potential to increase train traffic adjacent to the Planning Area. Law enforcement or emergency search and rescue activities, including USBP activities, could result in cumulative impacts. The All-American Canal lining project has eliminated lands available for OHV recreational opportunities in the Planning Area. The Drop 2 Reservoir project has reduced access and OHV recreational opportunities. The development of OHV recreational services on adjacent private lands has enhanced recreational opportunities.

The potential privatization of the Planning Area through a concessions contract could result in cumulative impacts through increased development of infrastructure and support services (e.g., hotels, campgrounds, restaurants, controlled access).

4.15 Transportation and Public Access

Dust and erosion control measures, as well as additional route maintenance, could have a beneficial impact by making public routes safer for travel and access.

Depending on the alternative, the opening, limitation, or closure of recreation areas could have a beneficial or adverse impact on transportation and public access by altering visitor use patterns. Displacement of visitors due to recreation area closures could result in overuse of remaining access routes and could cause an adverse impact. Public access could be improved through opening additional acreage for recreational use.

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a).

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Authorizations, ROWs, temporary use permits, leases (e.g., geothermal, wind, solar), or mining activity could result in temporary or permanent closure of public access, which could be an adverse impact. Geothermal, wind, and solar energy development could result in permanent closure of public access, which could be an adverse impact.

Acquisitions of inholdings or easements could enhance public access within the Planning Area, resulting in a beneficial impact.

Concessions could generate increased traffic volumes, thereby resulting in an adverse impact on transportation and public access. Infrastructure to facilitate recreation area management (e.g., controllable entry points) could have a beneficial or advese impact.

Social and economic impacts to Transportation and Access are discussed in Section 4.18.3 of this chapter.

4.15.1 Differences between Alternatives

Differences in impacts to transportation and public access would vary by alternative, depending on development of lands for geothermal resources, OHV management area

closures, solar and wind energy development, and access adjacent to the US–Mexico border.

Geothermal leasing availability would have the greatest potential adverse impacts to transportation and access under Alternatives 1, 2, and 7. Under these alternatives, 188,426 acres would be available for geothermal leasing, potentially disrupting or eliminating existing roadways and routes within the Planning Area. Geothermal leasing would have the lowest potential adverse impacts to transportation and access under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8). Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 188,426 acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Under Alternative 4, adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area, where transportation and access of the Planning Area may not be impacted. Under Alternatives 5 and 6, geothermal leasing would be limited to 11,939 acres within the Planning Area (see Table 4-1 and Map 2-10). Under Alternative 8, impacts to transportation and access would be marginally higher (35,115 acres versus 11,939 acres) than Alternatives 5 and 6. Potential adverse impacts to transportation and access would likely be concentrated in a relatively small portion of the Planning Area (five to 16 percent) under these alternatives.

Depending on the location of closed OHV management areas, the closure of certain OHV management areas would likely result in the closure of access and travel routes. Under Alternatives 1, 2, 4, 5, 6, and 7, transportation and access would likely remain the same. Under Alternatives 3 and 8, proposed closed OHV management areas within the ISD SRMA could potentially lead to the closure of the Dunebuggy Flats campground, depending on PMV rainfall thresholds. Under Alternative 3, the southern portions of Gecko Road campgrounds may be closed. Under Alternative 8, campgrounds south of Wash 25 and north of Wash 69 would be closed, but remain open to OHV recreation.

Under Alternatives 1, 2, and 7, lands available for solar and wind leasing would be the highest, resulting in greater potential adverse impacts to transportation and access. Under these alternatives, 188,833 acres would be available for solar and wind development, except the WA (see Table 4-1 and Maps 2-29 and 2-33), resulting in potential loss or reduction of travel routes and access. Under Alternatives 3 and 8, 47,131 and 35,416 acres, respectively, would be available for solar and wind lease and development (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36), resulting in a lower potential for loss or reduction of travel routes and access. Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as avoidance areas. Transportation and access may be adversely impacted under these alternatives if solar and wind energy proposals have no other reasonable location. Under these alternatives, the WA would continue to be excluded.

4.15.2 Unavoidable Adverse Impacts

Temporary closures (e.g., wash outs, accidents, or train derailments) would result in disruptions to public access. Local county actions (e.g., curfews) would result in limitations to public access. Route congestion could limit public access to the recreation area and would be considered an unavoidable adverse impact.

Construction activities within the BOR withdrawn area (e.g., canals) could cause temporary loss of access. Temporary construction or maintenance for USBP tactical infrastructure could limit public access.

Operational activities of the Mesquite Regional Landfill have the potential to significantly increase truck traffic volumes within the Planning Area, thereby adversely affecting transportation and public access, and would be considered an unavoidable adverse impact.

4.15.3 Cumulative Impacts

Construction activities within the BOR-withdrawn area (e.g., canals) could cause temporary loss of access. Temporary construction or maintenance for USBP tactical infrastructure within or adjacent to the Planning Area could limit public access. California Department of Transportation road maintenance within or adjacent to the Planning Area could be considered a cumulative impact.

Operational activities of the Mesquite Regional Landfill have the potential to significantly increase truck traffic volumes within the Planning Area, thereby adversely affecting transportation and public access, and would be considered a cumulative impact.

The establishment of a border safety zone would result in a cumulative impact to access in the area of the US-Mexico border.

4.16 Impacts on Lands and Realty Program

Special status species and special designations management could preclude lands and realty actions from being authorized. Management of desired plant communities (e.g., microphyll woodlands) could have an adverse impact on lands and realty authorizations.

Geothermal, wind, and solar energy development could result in additional lands and realty ROWs and authorizations. Any land acquisitions could increase lands available for lands and realty authorizations. ROW issuance could be facilitated by current and future utility corridors within the Planning Area.

Land acquisitions of private land from willing sellers could be used to enhance recreational opportunities and natural and cultural resources. Acquisitions of private land benefits various federal programs and results in long-term enhancement from BLM administration.

Utility ROWs may enhance access to the public lands for recreational opportunities or possibly lead to loss of public access or viewsheds. Utility ROWs may provide infrastructure for the needs of the recreating public (e.g., power lines, water).

Social and economic impacts to lands and realty are discussed in Section 4.18 of this chapter.

4.16.1 Differences between Alternatives

Table 2-16 (Lands and Realty) provides a breakdown of the proposed actions for lands and realty by alternative. Differences in impacts to lands and realty would vary by alternative. The primary differences are related to lands available for solar and wind development.

Under Alternatives 1, 2, and 7, lands available for solar and wind leasing would be the highest. Under these alternatives, 188,833 acres would be available for solar and wind development (including PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs); the 26,098 acres in the WA would be excluded (see Table 4-1 and Maps 2-29 and 2-33). Under Alternatives 3 and 8, 47,131 and 35,115 acres, respectively, within the Planning Area would be available for solar and wind development; the WA as well as the remainder of the Planning Area would be excluded (including PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs) (see Table 4-1 and Maps 2-30, 2-32, 2-34, and 2-36). Under Alternatives 4, 5, and 6, there would be 144,290 acres of land designated as development avoidance areas (including PMV critical habitat, flat-tailed horned lizard management area, donated lands, and ACECs) and 39,694 acres would be available. Within the avoidance areas, development may occur if no other reasonable alternative is found.

For apiary permits, under Alternatives 1, 4, 5, 6, 7, and 8, apiary permits would continue to be allowed on a case-by-case basis within strategically located sites to limit interaction with the public. Under Alternative 3, apiary permits would be prohibited within the Planning Area.

4.16.2 Cumulative Impacts

There are applications for geothermal, wind, and solar energy ROWs within and adjacent to the Planning Area. There is the potential that additional applications could be

approved and could result in a cumulative increase in renewable energy generated in the region.

In the CDD as a whole, there are numerous applications for a total of over 300,000 acres of public lands for renewable energy development. It is unknown at this time how many of these projects would be approved and constructed, but it is likely that the CDD would be an important resource for renewable energy generation.

In portions of the region, where communities are sustaining substantial growth, requests for land use authorizations would be anticipated to increase. If the magnitude of conflicts between wildlife habitat conservation and land-use authorizations increase, the availability of land-use authorizations could be diminished. When use authorizations are approved by the BLM in important wildlife habitat, they generally will be accompanied by requirements for habitat compensation/mitigation. As private lands are purchased to implement compensation requirements, the supply of private parcels in habitat areas would continue to decrease, making it more difficult to acquire lands in habitat areas.

4.17 Impacts on Public Health and Safety

Impacts to public health and safety would be considered significant if the implementation of an alternative would cause or potentially result in greater safety risks. Beneficial impacts could also result from implementation of an alternative that would minimize or significantly reduce certain health and safety issues.

Dust and erosion control measures would have a beneficial impact on the health and safety of the public, BLM employees, and other agency personnel.

The opening, limitation, or closure of recreational areas could have a beneficial or adverse impact on public health and safety by altering visitor use patterns. Increased visitor density could increase the potential for disputes involving visitors and public safety personnel. Recreational management goals promote public health and safety through partnerships and collaboration, which could have a net beneficial effect to the visitor experience and natural and cultural resource protection.

Some of the services provided by BLM-permitted commercial vendors (e.g., personal protective equipment, vehicle repairs, and vehicle safety equipment) could enhance public safety. Concessions (i.e., privatization) could control access to the Planning Area, thereby increasing public health and safety; however, this could also substantially reduce law enforcement funding (via fees) to provide for public health and safety. The services provided at recreational and administrative facilities (e.g., education, emergency medical services, and law enforcement) could enhance the public health and safety of visitors.

Restricting major access routes to street-legal vehicles could provide more effective traffic management, which would be a beneficial effect. Conversely, such restrictions could not only increase OHV traffic and speeding through campsites but also increase dust levels.

Any type of barricade, fencing, signage, or other physical structure within the Planning Area could have an adverse impact on public safety due to potential vehicle collisions with the structure(s).

Geothermal development can include multiple production and injection wells installed on pads that vary from 1 to 5 acres in size. Although they require less land for the plant itself, water-cooled geothermal systems need a continuous supply of water and create vapor plumes. Pipelines are constructed above ground, on supports, to transport geothermal fluids. Geothermal facilities can also include fencing, off-site access roads and transmission lines, ancillary buildings, water storage and discharge facilities, as well as drilling rigs or derricks and associated support facilities (Office of Indian Energy and Economic Development 2009a).

Utility-scale solar energy development can include commitment of a large land area for both PV and CSP systems. This land area would be used for the solar systems themselves (whether PV or CSP), ancillary buildings, water storage and discharge facilities, fencing, access roads, and offsite facilities such as a central power management facility with transmission and grid connections. The land disturbance would be greater for PV (9 acres per megawatt versus 5 acres per megawatt for CSP) due to the interconnectedness of the blocks of solar arrays and the lower efficiency rates. However, water use would be considerably greater for CSP, as PV uses minimal water (Office of Indian Energy and Economic Development 2009b). As with solar energy development, wind energy development can include commitment of a large land area. This land area would be used for the wind turbines themselves (which can range from 200 to 300 feet in height), as well as ancillary facilities, fencing, access roads, and a central power management facility with transmission and grid connections (Office of Indian Energy and Economic Development 2009c). Impacts to soil resources from wind energy development could include both compaction and erosion. Infrastructure associated with geothermal, solar, wind, or electrical transmission and generation could have an adverse impact on public health and safety as it could increase the potential for vehicular and aircraft collisions with the associated facility.

Communication site towers (e.g., cell or radio) could have a beneficial effect on public health and safety by supporting emergency communications and services. Temporary use permits for activities such as construction or filming could cause temporary hazardous conditions. Apiary activities could have an adverse impact (e.g., bee stings) on recreational visitors, depending on the location and density of apiary sites.

There are no known existing hazardous materials sites (see Appendix N) on BLM-administered lands within the Planning Area Any future encounters would be handled pursuant to BLM regulations. Reclamation of former mining sites and pits would reduce human safety hazards.

Because portions of the Planning Area were previously used for military training, UXO are likely to occur. Any encounters with UXO would be handled pursuant to BLM regulations and in coordination with local agencies. Coordination for removal and safe disposal of UXO with local agencies would promote public health and safety within the Planning Area.

The USBP is responsible for patrol and enforcement of the US-Mexico border. The potential exists for cross-traffic encounters between the public and law enforcement agents during enforcement activities. The establishment of a border safety zone could have a beneficial effect on public health and safety.

4.17.1 Differences between Alternatives

Differences in impacts to public health and safety from geothermal development, OHV management, solar and wind energy development, and US-Mexico border access would vary by alternative.

Geothermal leasing availability would have the greatest potential adverse impacts to public health and safety under Alternatives 1, 2, and 7. Geothermal leasing would have the lowest potential adverse impacts to public health and safety under Alternative 3. Under this alternative, activities related to geothermal leasing would not be allowed within the Planning Area (Map 2-8). Potential adverse impacts within the Planning Area related to geothermal facilities and development would also be low under Alternative 4. Under this alternative, 188,426 acres of the Planning Area would be available for geothermal leasing but with an NSO stipulation (Map 2-9). Under Alternative 4, adverse impacts related to construction and development of geothermal facilities would occur outside the Planning Area. Under Alternative 8, adverse impacts to public heath and safety would be marginally higher (35,115 acres versus 11,939 acres) than Alternatives 5 and 6. Potential adverse impacts to public health and safety would likely be concentrated in a relatively small portion of the Planning Area (five to 16 percent) under these alternatives.

Depending on the location of closed OHV management areas, changes in visitor use patterns and density of visitors could occur. Under Alternatives 1, 2, 4, 5, 6, and 7, access and campground availability would likely remain the same. Under Alternatives 3 and 8, proposed closed OHV management areas within the ISD SRMA could potentially lead to the closure of the Dunebuggy Flats, depending on PMV rainfall thresholds. These closures could likely lead to increased densities of visitors within remaining

campgrounds, potentially increasing disputes between visitors and public safety personnel and resulting in adverse impacts to public health and safety.

Under Alternatives 1, 2, and 7, lands available for solar and wind leasing would be the highest. Under these alternatives, 188,833 acres would be available for solar and wind development; the 26,098 acres in the WA would be excluded (see Table 4-1 and Maps 2-29 and 2-33). Under these alternatives, there would be an increased risk to public health and safety from collision with infrastructure related to development resulting in adverse impacts to public health and safety. Under Alternatives 3 and 8, 47,131 and 35,416 acres, respectively, within the Planning Area would be available for solar and wind development; the WA as well as the remainder of the Planning Area would be excluded (see Table 4-1 and Maps 2-30, 2-32, 2-34 and 2-36). Under this alternative, potential collisions and other public health and safety issues related to infrastructure would be minimized, also minimizing adverse impacts to public health and safety. Under Alternatives 4, 5, and 6, 144,290 acres of land would be designated as development avoidance areas and 39,694 acres would be available for development. Within the avoidance areas, development may occur if no other reasonable alternative is found. Public health and safety adverse impacts under these alternatives may be moderate, depending on the areas developed for solar and wind facilities.

Access and travel adjacent to the US-Mexico border varies by alternative (Table 2-20). Under Alternatives 1, 2, 7, and 8 public access and travel adjacent to the US-Mexico border would remain open. Under these alternatives, potential unsafe encounters with border enforcement activities and illegal activities related to the US-Mexico border would continue, resulting in adverse impacts to public health and safety. Under Alternative 3, the area within 100 feet of the US-Mexico border would be closed to public access and travel, potentially reducing adverse impacts of unsafe encounters with speeding law enforcement vehicles, smugglers, and other border related hazards. Under Alternatives 4, 5, and 6, a 60-foot area (called the Roosevelt Reservation) adjacent to the US-Mexico border would be closed to public travel and access, also potentially reducing adverse impacts of unsafe encounters as mentioned for Alternative 3.

4.17.2 Unavoidable Adverse Impacts

Inadvertent exposure to or encounters with any of the following public health and safety hazards could result in serious injury or death, which would be an unavoidable adverse impact.

Periodic flash flooding could adversely impact public health and safety in the Glamis area and lead to disruptions in access as well as potential hazardous material situations. Disruptions of access (e.g. roads being washed out or undermined) could create dangerous situations for vehicle travel. Flash flooding events could also result in

overflow of vault toilets and RV septic systems, thereby creating human health hazards resulting in unavoidable adverse impacts.

Increased visitor density resulting from private land recreational events could impact public health and safety during specific timeframes, which could potentially increase conflicts between visitors and require law enforcement intervention.

Activities (e.g., camping, OHV recreation, smuggling) adjacent to the canals within the Planning Area have the potential to lead to drownings and/or injuries through unauthorized or accidental entry.

Hazardous material spills (e.g., along I-8 or SR-78, from UPRR derailments) and unauthorized disposal of hazardous materials could have an unavoidable adverse impact on public health and safety.

Illegal crossing of train tracks by visitors could result in serious injury and/or death.

Operational activities associated with the Mesquite Regional Landfill have the potential to significantly increase traffic volumes within the Planning Area, which would be considered an unavoidable adverse impact to public health and safety.

4.17.3 Cumulative Impacts

The UPRR fencing project at Wash Road could have an adverse cumulative impact on public health and safety. The US-Mexico border barrier would result in beneficial cumulative impacts to public health and safety by delineating the US–Mexico border, restricting access, and reducing smuggling activity.

Regional population growth and the increasing popularity of OHV recreation could create more demand for recreational opportunities, which could result in an adverse cumulative impact on public health and safety within the Planning Area.

There are several activities within the Planning Area and general vicinity that could add to cumulative noise effects, including:

- Train noise associated with the UPRR double tracking project along the east side of the Planning Area
- Noise associated with recreational and support activities, especially both concentrated and dispersed OHV uses of the Planning Area and immediate vicinity
- Vehicular traffic noise on major roadways leading to the Planning Area

- Intermittent military aircraft maneuvers and military weapons explosions associated with the use of the Chocolate Mountain Aerial Gunnery Range located to the northwest of the Planning Area and a gunnery range north of East Mesa
- Occasional military aircraft overflights associated with flight corridors located above and adjacent to the Planning Area
- Military helicopter use of the Planning Area as a training ground for the use of night vision devices
- Mineral exploration, including drilling by Mesquite Mine and/or Glamis Imperial under existing BLM approvals
- Construction of utility lines
- Construction activities, pursuit activities and medical response activities conducted by USBP. These activities may include the use of a helicopter, heavy equipment, and law enforcement vehicles.

4.18 Social and Economic Impacts

Management activities and land use decisions made in implementing the ISD RAMP would likely have effects on local and regional social and economic conditions. The resource capabilities or uses that would have the greatest potential to affect the social and economic environment include: Mineral Resource Management, Recreation Management, Transportation and Public Access, and Lands and Realty Management. The analysis of impacts to social and economic conditions is focused on these resource uses, which are discussed in their respective subsections.

Impacts to social conditions were identified as those management and land use decisions that would potentially affect the social aspect of: changes to use and lifestyle; people's interaction with the landscape; community perceptions of quality of life; attitudes and beliefs regarding the local environment, its uses, and sense of place; potential demand on BLM-administered land and resources; and limiting or enhancing community growth.

Impacts to economic conditions were identified as those management and land use decisions that would potentially affect the economic aspects of: revenue, employment/unemployment, personal income, and county tax base.

The economic subsections discuss the net change in total economic activity (the environmental consequence) associated with each of the proposed DRAMP alternatives for the Planning Area. The net changes in economic activity are measured relative to the

economic baseline (existing condition) identified in Chapter 3, Section 3.18 Social and Economic Setting.

In general, the total amount of economic activity on BLM-administered lands in the Planning Area represents a small portion of the $23.1 billion total output of the economy within the EIA. This is true for each of the BLM's program functions within the Planning Area (e.g., permits, ROWs, and recreation), although the recreation activity within the Planning Area is recognized as important for the EIA economy, even if it is not substantial and represents less than one percent of the total economic output of the EIA economy. It is not expected that any of the proposed DRAMP alternatives would result in any significant economic impacts. Furthermore, the cumulative economic impacts of the BLM-administered lands in the Planning Area represent a small portion of the EIA economy as a whole and none of the proposed alternatives would result in a significant cumulative economic effect.

Please note that there is the potential for large-scale geothermal, solar, and wind energy development on BLM-administered lands within the Planning Area. The timing, feasibility, size, and specific location of these potential developments are unknown. As part of the application process, an applicant for a renewable energy project would be required to develop a detailed POD. The POD would be used as a basis for the Proposed Action that would be analyzed by the BLM to make a decision on the renewable energy project.

4.18.1 Impacts on Mineral Resources

4.18.1.1 Social Impacts

Mineral resources support community needs both inside and outside of the Planning Area. Mineral aggregates support construction and associated infrastructure; energy-related minerals support power generation, transportation, and economic development; and chemicals from industrial minerals enhance our standard of living.

Leasable mineral resources consist primarily of oil, gas, coal, and geothermal. There are no commercial oil, gas, or coal extraction operations on BLM-administered lands in the Planning Area, and the potential for hydrocarbon resources is low to non-existent. There is potential for geothermal development within the Planning Area.

Salable mineral resources relate primarily to sand and gravel extraction. There is one sand and gravel extraction operation on BLM-administered lands within the Planning Area. This non-commercial sand and gravel extraction activity is operated under a free-use permit granted by BLM to the County of Imperial. This activity is not located within the boundaries of the ISD SRMA, it is located within the ISD ERMA. No additional sand and gravel areas are proposed under any alternatives.

Locatable mineral resources include such metals as gold, silver, copper, uranium, and lead; non-metallic minerals such as asbestos, gypsum, borax, and mica; and gemstones such as turquoise, tourmaline, and diamonds. There are no locatable resource extraction operations on BLM-administered lands within the Planning Area. The potential for future development of metallic and non-metallic/industrial minerals is considered low.

Despite the potential increase in demand for mineral resources in and around the Planning Area, no impact to or change in community lifestyle is anticipated. Potential adverse impacts may occur to the way people/visitors interact with the landscape, if mineral resource demand increases, particularly related to geothermal mineral leases. Visitors and recreationists may have an adverse reaction to the disturbed landscapes created by geothermal development and extraction activities.

Community perceptions regarding quality of life may be adversely impacted by population and mineral resource demand increases. The perception may be that the quality of life (quality of recreational experience) would decrease or decline as demand for mineral resources increases and development activities occur within the Planning Area.

Both beneficial and adverse social impacts from mineral resource management would likely occur. Beneficial impacts would occur from the continued and expanded availability of leasable and salable mineral resources to the community. Adverse impacts would occur from the potential conflict between recreational activities and mineral resource development, primarily from lands available for geothermal development.

4.18.1.2 Economic Impacts

4.18.1.2.1 Locatables

No measurable commercial activity for mining exists. No Plans of Operations have been submitted to the BLM to mine within the Planning Area. The existing conditions for locatables on BLM lands within the Planning Area did not yield an economic output. Therefore, no economic baseline exists for locatable minerals, and no economic impacts are anticipated under any of the proposed alternatives.

4.18.1.2.2 Leasables

There are no oil, gas, or coal leases on BLM-administered lands within the Planning Area. The existing conditions for oil, gas, and coal resources on BLM lands within the Planning Area did not yield a financially viable output. Therefore, no economic baseline exists for oil, gas, or coal energy production and no economic impacts are anticipated under any of the proposed alternatives.

There are no geothermal leases on BLM-administered lands within the Planning Area. There is no current commercial production of geothermal energy on BLM-administered lands within the Planning Area. If and when a project is proposed to the BLM, the BLM and operator(s) would need to prepare a project-specific POD. Each POD would need to address the potential impacts—including economic and social impacts—of a proposed geothermal mineral lease and development.

4.18.2 Impacts on Recreation Program

4.18.2.1 Social Impacts

The primary use of the Planning Area is recreation. There are numerous recreational communities of interest who use the area: OHV enthusiasts, campers, hunters, day hikers, backpackers, wildlife enthusiasts, and motor tourists.

Local community members have expressed a concern that if OHV recreation within the Planning Area is restricted, more recreational users who are turned away may trespass into privately owned land. This conflict is becoming more apparent as OHV enthusiasts from urban areas travel to ever more distant areas for recreation (California State Parks 2002).

OHV regulations and changes in designations specific to certain areas would likely have little impact on new visitors from outside the region. New visitors would continue to have a variety of OHV opportunities available, which would become their frame of reference for OHV activities during subsequent visits. Minimal impact to social conditions would likely occur from OHV management decisions or designations affecting new visitors.

Frequent users and local individuals and/or groups may have beneficial or adverse reactions if certain favorite areas are not as open to satisfy their specific OHV recreation and history in the Planning Area. Impacts to frequent users and/or groups may be significant individually, but would not likely have an overall significant impact on the social condition of the Planning Area. A variety of opportunities offering different OHV experiences would continue to be available for both new and frequent visitors.

The designation of closed OHV management areas would result in the loss of motorized recreational opportunities, which would directly impact visitors' use of the Planning Area. The majority of closed OHV management areas (26,098 acres) for all alternatives consists of the congressionally designated wilderness. The Wilderness Act of 1964 mandates BLM to enforce the prohibition of motorized vehicles on these designated lands.

The demand for recreational opportunities on public lands in the Planning Area is expected to continue to increase, both as a result of the increasing population and the

growing numbers of seasonal visitors (primarily in the fall and winter). Increasing demand for recreational opportunities creates pressure for BLM to provide additional recreation resources. Demands also increase for facilities (such as vault toilets), as well as interpretive and visitor service programs. Any land use decisions or activity made would have impacts on recreation and, therefore, on social conditions in the Planning Area. Additional planning, management, staffing, and funding would likely be required to achieve the goals for recreation management in the Planning Area.

Large groups of public land visitors within the Planning Area participate in formal or informal OHV clubs and activities. These opportunities provide visitors with a sense of community and belonging with those who enjoy experiencing the public lands in the same manner and result in a beneficial social impact overall. The designation of specific areas for camping and day-use activities generally concentrates visitor use. This concentration of visitor use, along with installation of recreation facilities and signs, promotes a sense of community and improved environmental stewardship of the public lands.

4.18.1.2 Economic Impacts

4.18.1.2.1 Economic Methodology for Alternatives

In Chapter 3, the analysis of recreation activities within the Planning Area and the associated economic impacts established a baseline (existing condition) for the number of visitors, visitor groups, and visitor days. For the existing condition, it was established that there are an annual 350,000 towing vehicles, based on the 2006 Planning Area recreation survey. To develop estimates of tow vehicles and visitor groups for each of the proposed management alternatives, the change in the amount of riding acreage from the existing condition (51,727 acres) was used as the primary adjustment parameter as described below.

Alternative 1 depicts the conditions that would have occurred currently had the Administrative Closures not occurred in 2001. The riding area under Alternative 1 is 84,592 acres. If riding areas are proportionally used to expand current activities with OHV closures to estimated activities without closures, 579,180 towing vehicle visits would be expected compared to 350,000 under Alternative 2. However, based on growth rates indicated in the California State Parks publication, *Taking the High Road*, current unconstrained demand would only result in 531,714 towing vehicle visits (2002). Thus, under Alternative 1, 47,466 (i.e., 579,180 versus 531,714) more vehicles could be accommodated in the future (see Table 4-10).

TABLE 4-10
SUMMARY OF VEHICLE ESTIMATES BY ALTERNATIVE

	Alternative							
	1	2	3	4	5	6	7	8
Towing Vehicles	531,714	350,000	232,073	479,669	456,731	473,776	523,974	531,714

Alternative 2 is the current condition with existing Administrative Closures as discussed in Chapter 3. The riding area under this alternative is 51,727 acres. Based on the estimate provided in "A Profile of the 2006 Visitor to the Imperial Sand Dunes Recreational Area," the current conditions render 350,000 towing vehicle visits annually (i.e., 1.4 million visitors divided by 4 visitors per vehicle).

Alternative 3 would result in the closure of campgrounds along the southern end of Gecko Road and Dunebuggy Flats campground. This represents roughly one-third of the user activity within the Planning Area. It is assumed that half of the displaced one-third of Planning Area visitors would relocate to other campgrounds within the Planning Area. The other half of the displaced Planning Area visitors are assumed to leave for alternative OHV areas such as Ocotillo (i.e., visitation would be permanently displaced to alternative riding areas outside of the Planning Area through substitution effects). Therefore, 57,750 towing vehicles are assumed to leave for alternative OHV areas outside the Planning Area, while the other 57,750 would disperse within the Planning Area. Under Alternative 3, the riding area shrinks from the current 51,727 acres to 41,076 acres. However, the 292,250 remaining towing vehicles left within the Planning Area would be further reduced due to the fact that there would be less riding area. Only 232,073 towing vehicles would remain within the Planning Area (i.e., 292,250 x 80 percent). This alternative represents roughly 66 percent of the existing base in terms of activity.

Alternative 4 would increase the riding areas within the Planning Area to 70,891 acres from 51,727 acres under Alternative 2. This represents a 37 percent increase in riding area. Assuming usage would increase in proportion to riding area, the estimated level of towing vehicles would increase to 479,669 (i.e., 350,000 x [70,891 ÷ 51,727]).

Alternative 5 may result in the closure of the Dunebuggy Flats campground. This would represent a 15 percent decrease in Planning Area activity under current Alternative 2 levels. However, the potential 15 percent displacement would be assumed to be absorbed in other Planning Area campgrounds because the riding acreage would increased to 67,355 acres from the Alternative 2 base of 51,727 acres. Assuming usage would increase in proportion to riding area, the estimated level of towing vehicles would be 456,731 (i.e., 350,000 x [67,355 ÷ 51,727]).

Alternative 6 would increase the riding area to 69,869 acres. Assuming a proportional increase in usage, the estimated level of towing vehicles would be 473,776 (i.e., 350,000 x [69,869 ÷ 51,727]).

Alternative 7 would increase the riding area to 77,439 acres. Assuming a proportional increase in usage, the estimated level of towing vehicles would be 523,975 (i.e., 350,000 x [77,439 ÷ 51,727]).

Alternative 8 would increase the riding area to 79,038 acres. Assuming a proportional increase in usage up to the unconstrained limit of Alternative 1, the estimated level of towing vehicles would be 531,714 (i.e., 350,000 x [79,038 ÷ 51,727]).

4.18.1.2.2 Economic Impacts by Alternative

No significant economic impacts from recreation activities within the Planning Area were determined for any of the proposed alternatives. The net changes in economic activity from the baseline (existing condition) are listed for the direct, indirect, and cumulative impacts for each planning alternative as summarized in Table 4-11. As listed in the table, the largest increase in total economic output ($88.6 million) for recreation would occur under Alternatives 1 and 8. The largest decline in total economic output (minus $57.0 million) would occur under Alternative 3. Neither of these extremes represents a significant economic impact relative to the much larger EIA economy. Similarly, the cumulative employment impacts would range from an increase of about 1,111 jobs for Alternative 1 to a decrease of about 725 jobs for Alternative 3 and would not represent a significant economic impact relative to the much larger employment base (168,000) reported for the EIA economy.

TABLE 4-11
NET CHANGE IN ECONOMIC IMPACTS BY ALTERNATIVE:
ANNUAL RECREATION ACTIVITIES WITHIN THE PLANNING AREA

Impact Category	Direct	Indirect & Induced	Cumulative
Alternative 1			
Dollar Value	$ 58,319,755	$ 30,304,706	$ 88,624,461
Employment	843.44	267.30	1,110.74
Labor Income	$ 24,659,275	$ 10,382,426	$ 35,041,701
Property Income	$ 6,755,379	$ 5,479,893	$ 12,235,272
Tax Revenue	$ 7,712,116	$ 1,696,567	$ 9,408,683
Value Added	$ 39,126,798	$ 17,558,896	$ 56,685,693

TABLE 4-11
NET CHANGE IN ECONOMIC IMPACTS BY ALTERNATIVE:
ANNUAL RECREATION ACTIVITIES WITHIN THE PLANNING AREA (CONT.)

Impact Category	Direct	Indirect & Induced	Cumulative
Alternative 2			
Dollar Value	$ 0.00	$ 0.00	$ 0.00
Employment	0.00	0.00	0.00
Labor Income	$ 0.00	$ 0.00	$ 0.00
Property Income	$ 0.00	$ 0.00	$ 0.00
Tax Revenue	$ 0.00	$ 0.00	$ 0.00
Value Added	$ 0.00	$ 0.00	$ 0.00
Alternative 3			
Dollar Value	$ (38,057,370)	$ (19,775,761)	$ (57,833,131)
Employment	(550.42)	(174.42)	(724.84)
Labor Income	$ (16,091,754)	$ (6,775,197)	$ (22,866,951)
Property Income	$ (4,408,317)	$ (3,575,981)	$ (7,984,298)
Tax Revenue	$ (5,032,649)	$ (1,107,118)	$ (6,139,767)
Value Added	$ (25,532,738)	$ (11,458,302)	$ (36,991,040)
Alternative 4			
Dollar Value	$ 41,985,705	$ 21,817,041	$ 63,802,746
Employment	607.22	192.44	799.66
Labor Income	$ 1 7,752,767	$ 7,474,543	$ 25,227,310
Property Income	$ 4,863,350	$ 3,945,098	$ 8,808,448
Tax Revenue	$ 5,552,126	$ 1,221,397	$ 6,773,523
Value Added	$ 28,168,263	$ 12,641,044	$ 40,809,307
Alternative 5			
Dollar Value	$ 32,157,803	$ 16,710,167	$ 48,867,970
Employment	465.08	147.37	612.45
Labor Income	$ 13,597,247	$ 5,724,922	$ 9,322,168
Property Income	$ 3,724,950	$ 3,021,640	$ 6,746,590
Tax Revenue	$ 4,252,499	$ 935,495	$ 5,187,995
Value Added	$ 21,574,711	$ 9,682,062	$ 31,256,773
Alternative 6			
Dollar Value	$ 36,659,018	$ 19,049,132	$ 55,708,150
Employment	530.19	168.03	698.22
Labor Income	$ 15,500,490	$ 6,526,254	$ 22,026,745
Property Income	$ 4,246,341	$ 3,444,587	$ 7,690,929
Tax Revenue	$ 4,847,733	$ 1,066,439	$ 5,914,172
Value Added	$ 24,594,582	$ 11,037,287	$ 35,631,869

TABLE 4-11
NET CHANGE IN ECONOMIC IMPACTS BY ALTERNATIVE:
ANNUAL RECREATION ACTIVITIES WITHIN THE PLANNING AREA (CONT.)

Impact Category	Direct	Indirect & Induced	Cumulative
Alternative 7			
Dollar Value	$ 51,811,681	$ 26,922,915	$ 78,734,596
Employment	749.32	237.46	986.78
Labor Income	$ 21,907,474	$ 9,223,821	$ 31,131,294
Property Income	$ 6,001,527	$ 4,868,376	$ 10,869,902
Tax Revenue	$ 6,851,498	$ 1,507,242	$ 8,358,740
Value Added	$ 34,760,523	$ 15,599,447	$ 50,359,969

Note: The zero values in this table represent no change from the existing condition (the net economic impact that would result from implementing Alternative 2).

Source: MIG IMPLAN/Pro and CIC Research, Inc. (2006)

4.18.3 Impacts on Transportation and Public Access

4.18.3.1 Social Impacts

Motorized transport is not allowed in the WA. Motorized access within ACECs is limited to existing or designated routes, except as authorized. Representatives of the OHV community have suggested that they are reasonably satisfied with the current situation, but would object to further reductions. Other recreational communities, particularly non-motorized user communities, may view the reduction of OHV open areas as a beneficial social impact.

ROWs for renewable energy (i.e., solar and wind) could result in closure of areas to public access as a result of public health and safety concerns. These areas would be relatively small, and their closure would not likely cause significant social impacts. Access for authorized uses such as minerals extraction may also restrict access, but because the Planning Area has very few mineral resources, this access issue is unlikely to be significant.

No social impacts are anticipated to occur as a result of management activities and land use decisions related to transportation and public access proposed under all alternatives for the implementation of the ISD RAMP.

4.18.3.2 Economic Impacts

The majority of annual economic impacts for routes of travel on BLM land are associated with the maintenance of paved and unpaved roadways. As described in Chapter 2, the routes of travel are common to all alternatives. The Planning Area routes of travel annual

maintenance costs would not change under any of the proposed alternatives (see Table 3-31). Therefore, all proposed alternatives for routes of travel would result in no change from the existing economic condition. No direct, indirect, or cumulative economic impacts would be generated for the EIA economy.

The annual economic value generated by maintenance of routes of travel within the Planning Area is an insignificant portion of the EIA economy and does not generate an adverse economic impact.

4.18.4 Impacts on Lands and Realty Program

4.18.4.1 Social Impacts

As communities expand and populations grow, there is an increased need for access across public lands for roads, utilities, and other infrastructure. The demand on public lands within the Planning Area to meet community needs includes, but is not limited to, utility corridors, renewable energy (such as solar and wind), apiary permits, film permits, and communications sites.

ROWs may enhance access to the public lands for recreational opportunities. In addition, ROWs may provide infrastructure for the needs of the recreating public (e.g., power lines, water, and sewer lines). However, ROW authorizations may adversely impact the recreational opportunities by encumbering public lands and viewsheds.

4.18.4.1.1 Utility Corridors

Public input suggests that social impact issues relating to utility corridors are primarily related to the visual impacts of high voltage power lines. Under all alternatives, major utility ROWs would be placed within the existing utility corridors, which would minimize new visual adverse impacts to already impacted areas.

Designated utility corridors and communications sites allow for the installation of additional facilities to provide services to the recreation community as it grows. This would likely enhance the social environment by allowing additional infrastructure to meet public demands and needs.

4.18.4.1.2 Renewable Energy

Social impacts of renewable energy development relate primarily to visual impacts and loss of access. Anecdotal evidence suggests that some people view solar and wind power generating facilities as a form of visual pollution. Social impacts may also include noise and dust from roads required to access facilities and closure of recreation areas for facility development and security. The environmental community has tended to look

upon renewable energy facilities as a way of reducing air and water pollution associated with fossil fuel production, resulting in a beneficial social impact to this community.

4.18.4.2 Economic Impacts

4.18.4.2.1 Utility Corridors

The majority of annual economic impacts for utility corridor ROWs are associated with the cleaning, inspection, and maintenance of transmission towers and overhead lines, or alternatively underground pipelines and conduits. The average land development and construction cost may vary significantly with terrain and other factors. San Diego Gas and Electric is a major user of utility ROWs on BLM-administered lands. The average annual cost per mile of maintained utility ROW ranges from $30,000 to $40,000 per mile within the Planning Area based on data provided by San Diego Gas & Electric. The Planning Area utility corridor ROW would not change under any of the resource management plan alternatives. Therefore, all proposed alternatives for utility corridor ROW would result in no change from the existing economic condition. No direct, indirect, or cumulative economic impacts would be generated for the EIA economy.

The annual economic value generated by annual maintenance of utility corridors within the Planning Area is an insignificant portion of the $23.1 billion total output within the EIA economy and does not generate an adverse economic impact.

4.18.4.2.2 Communication Sites

No new communication sites are proposed under any of the proposed alternatives. No changes in the economic condition of communications sites under the lands and realty program are anticipated; therefore, no economic impacts due to the proposed alternatives would be expected. The cumulative annual impacts would be insignificant relative to the size of the EIA economy.

The annual economic value generated by BLM communication facilities represents a very small portion of the Planning Area EIA economy and would not be expected to have a substantial economic impact, beneficial or adverse. The annual economic value generated by annual maintenance of communication sites within the Planning Area is an insignificant portion of the $23.1 billion total output within the EIA economy and does not generate an adverse economic impact.

4.18.4.2.3 Apiary Permits

Apiary permit activity and resource management would not change under Alternatives 1, 2, 4, 5, 6, 7, and 8. As a result there would be no economic change for these alternatives compared with the existing condition (see Table 4-12). Apiary permits would not be allowed under Alternative 3. The resulting net cumulative total economic impact of

Alternative 3 would be a decrease in output of about $361,000 per year and a cumulative decrease of about 3.6 jobs per year. This level of decrease in economic output and labor is negligible and would not have an adverse impact on the EIA economy.

The annual economic value generated by annual apiary production activities within the Planning Area is an insignificant portion of the $23.1 billion total output within the EIA economy and does not generate an adverse economic impact.

TABLE 4-12
NET CHANGE IN ECONOMIC IMPACTS BY ALTERNATIVE:
APIARY PERMITS AND ANNUAL BEEHIVE PRODUCTION WITHIN THE PLANNING AREA

Impact Category	Direct	Indirect & Induced	Cumulative
Alternatives 1, 2, 4, 5, 6, 7, and 8			
Dollar Value	$ 0.00	$ 0.00	$ 0.00
Employment	0.00	0.00	0.00
Labor Income	$ 0.00	$ 0.00	$ 0.00
Property Income	$ 0.00	$ 0.00	$ 0.00
Tax Revenue	$ 0.00	$ 0.00	$ 0.00
Value Added	$ 0.00	$ 0.00	$ 0.00
Alternative 3			
Dollar Value	$ (227,500)	$ (133,298)	$ (360,798)
Employment	(2.42)	(1.14)	(3.56)
Labor Income	$ (68,893)	$ (41,433)	$ (110,326)
Property Income	$ (41,807)	$ (24,008)	$ (65,814)
Tax Revenue	$ (6,089)	$ (6,650)	$ (12,740)
Value Added	$ (116,789)	$ (72,091)	$ (188,880)

Note: The zero values in this table represent no change from the existing condition (the net economic impact that would result from implementing Alternatives 1, 2, 4, 5, 6, 7, or 8).

Source: MIG IMPLAN/Pro and CIC Research, Inc. (2006)

4.18.4.2.4 Renewable Energy

There is no current commercial production of solar or wind energy on BLM-administered lands within the Planning Area. If and when a project is proposed to the BLM, the BLM and operator(s) would need to prepare a project-specific POD. Each POD would need to address the potential impacts—including economic and social impacts—of proposed solar or wind energy lease and development.

4.18.4.2.5 Film Permits

Film permit activity and resource management would not change under any of the proposed alternatives. As a result there would be no economic change compared with the existing condition (see Table 3-35). No cumulative economic impacts to the EIA economy would be generated by any of the alternatives for film permits and film or still photograph activities in the Planning Area.

The annual economic value generated by commercial filming and photography activities within the Planning Area is an insignificant portion of the EIA economy and does not generate an adverse economic impact.

4.18.5 Summary of Economic Impacts by Alternative

No significant economic impacts were determined for any of the proposed alternatives. The net change in the combined cumulative impacts (the net change in total impact over all resource management programs) for each alternative is summarized in Table 4-12. The total annual economic value generated by Planning Area land use activities is an insignificant portion of the economic impact area economy and does not generate an adverse economic impact.

As listed in Table 4-13, the largest increase in total economic output ($88.6 million) would occur under Alternatives 1 and 8. The largest decline in total economic output (minus $57.8 million) would occur under Alternative 3. None of these extremes (Alternative 1, 8, or 3) represents a significant economic impact change relative to the much larger EIA economy. Similarly, the cumulative employment impacts would range from an increase of about 1,111 jobs under Alternative 1 to a decrease of about 714 jobs under Alternative 3 and would not represent a significant economic impact relative to the much larger employment base (168,000) reported for the EIA economy.

It was not unexpected, but it is interesting to note that recreation activities within the Planning Area are responsible for more than 98 percent of the cumulative total economic output generated for the Planning Area. Furthermore, recreation activities are responsible for more than 99 percent of the net cumulative change in economic output expected for each proposed alternative.

TABLE 4-13
NET CHANGE IN ECONOMIC IMPACTS BY ALTERNATIVE:
ANNUAL TOTAL ACTIVITY WITHIN THE PLANNING AREA

Impact Category	Direct	Indirect & Induced	Cumulative
Alternative 1			
Dollar Value	$ 58,330,255	$ 30,310,787	$ 88,641,042
Employment	843.53	267.35	1,110.88
Labor Income	$ 24,663,529	$ 10,384,489	$ 35,048,018
Property Income	$ 6,755,933	$ 5,480,818	$ 12,236,751
Tax Revenue	$ 7,712,259	$ 1,696,938	$ 9,409,197
Value Added	$ 39,131,749	$ 17,562,254	$ 56,694,003
Alternative 2			
Dollar Value	$ (217,000)	$ (127,217)	$ (344,217)
Employment	(2.33)	(1.09)	(3.42)
Labor Income	$ (64,639)	$ (39,371)	$ (104,010)
Property Income	$ (41,253)	$ (23,083)	$ (64,336)
Tax Revenue	$ (5,946)	$ (6,279)	$ (12,225)
Value Added	$ (111,838)	$ (68,733)	$ (180,571)
Alternative 3			
Dollar Value	$ (38,064,796)	$ (19,794,079)	$ (57,858,875)
Employment	(549.72)	(174.55)	(724.27)
Labor Income	$ (16,067,779)	$ (6,777,258)	$ (22,845,037)
Property Income	$ (4,425,294)	$ (3,579,372)	$ (8,004,666)
Tax Revenue	$ (5,010,881)	$ (1,107,301)	$ (6,118,182)
Value Added	$ (25,503,972)	$ (11,463,937)	$ (36,967,909)
Alternative 4			
Dollar Value	$ 41,626,797	$ 21,631,165	$ 63,257,962
Employment	601.97	190.76	792.73
Labor Income	$ 17,600,825	$ 7,410,841	$ 25,011,666
Property Income	$ 4,821,114	$ 3,911,312	$ 8,732,426
Tax Revenue	$ 5,503,419	$ 1,211,021	$ 6,714,441
Value Added	$ 27,925,378	$ 12,533,181	$ 40,458,559
Alternative 5			
Dollar Value	$ 34,265,020	$ 17,805,764	$ 52,070,784
Employment	495.50	157.04	652.54
Labor Income	$ 14,488,054	$ 6,100,254	$ 20,588,308
Property Income	$ 3,968,373	$ 3,219,579	$ 7,187,952
Tax Revenue	$ 4,529,909	$ 996,862	$ 5,526,771
Value Added	$ 22,986,352	$ 10,316,700	$ 33,303,052

TABLE 4-13
NET CHANGE IN ECONOMIC IMPACTS BY ALTERNATIVE:
ANNUAL TOTAL ACTIVITY WITHIN THE PLANNING AREA (CONT.)

Impact Category	Direct	Indirect & Induced	Cumulative
Alternative 6			
Dollar Value	$ 39,735,486	$ 20,648,386	$ 60,383,872
Employment	574.60	182.12	756.72
Labor Income	$ 16,801,125	$ 7,074,138	$ 23,875,263
Property Income	$ 4,602,036	$ 3,733,599	$ 8,335,636
Tax Revenue	$ 5,253,315	$ 1,156,002	$ 6,409,317
Value Added	$ 26,656,495	$ 11,963,746	$ 38,620,241
Alternative 7			
Dollar Value	$ 55,846,160	$ 29,019,978	$ 84,866,138
Employment	807.62	255.96	1,063.58
Labor Income	$ 23,613,182	$ 9,942,255	$ 33,555,438
Property Income	$ 6,468,192	$ 5,247,405	$ 11,715,597
Tax Revenue	$ 7,383,766	$ 1,624,674	$ 9,008,440
Value Added	$ 37,465,166	$ 16,814,343	$ 54,279,510
Alternative 8			
Dollar Value	$ 58,330,255	$ 30,310,787	$ 88,641,042
Employment	843.53	267.35	1,110.88
Labor Income	$ 24,663,529	$ 10,384,489	$ 35,048,018
Property Income	$ 6,755,933	$ 5,480,818	$ 12,236,751
Tax Revenue	$ 7,712,259	$ 1,696,938	$ 9,409,197
Value Added	$ 39,131,749	$ 17,562,254	$ 56,694,003

Source: MIG IMPLAN/Pro and CIC Research, Inc. (2006)

4.18.6 Cumulative Impacts

The Mesquite Regional Landfill and the associated garbage truck traffic are viewed as an adverse impact on the recreational experience.

The presence of the UPRR is viewed as an adverse impact on the recreational experience. Train traffic creates large amounts of diesel smoke that can be seen and smelled for a long distance, as well as noise that can be heard well away from the UPRR.

4.19 Impacts on Environmental Justice

The goal of EO 12898, issued in 1994, was to preclude federal actions from creating disproportionate impacts to minority and low-income populations. Economic data upon

which to base possible environmental justice effects (i.e., the geographic distribution of minority and low-income populations and their changes over time) were presented in Chapter 3, Section 3.19.

The economic data and discussion in Chapter 3, Section 3.19 did not reveal evidence of environmental justice issues. Implementing any of the proposed alternatives would not result in disproportionate adverse plan-related effects on minority or low-income groups. No substantial changes to ethnic communities or low-income neighborhoods were detected. There is no indication that any of the proposed alternatives would have substantial adverse economic effects on any particular ethnic or low-income group as compared to others.

Field observations suggest that visitors to the Planning Area are overwhelmingly White. Management decisions within the Planning Area would not likely affect a minority population.

There are no identifiable disproportionate adverse impacts to the Quechan or other Native American tribes in the area. There is no evidence to suggest that environmental justice is an issue within the Planning Area.

BLM management actions and land use decisions are primarily driven by the resource base and the public involvement process. Unlike other entities involved in siting of facilities and land uses within a community or region, BLM makes resource decisions relying most heavily on where the particular resources occur (e.g., geothermal potential areas and vegetative communities) and where the visitor uses have occurred in the past (e.g., OHV recreation and camping areas).

4.19.1 Minority and Low-income Communities

The BLM is aware that there are small pockets of poverty and/or minority populations scattered throughout the region of the Planning Area. However, the BLM has not identified any communities within the Planning Area with low income or minority populations that may be impacted by proposed alternatives for BLM-administered lands.

CHAPTER 5.0
Consultation and Coordination

5.1 Interrelationships

The nature of use on the BLM-administered land in the Planning Area makes it essential for BLM to collaborate, cooperate, and coordinate with adjacent and intermingled land owners, managers, and stakeholders in the development and implementation of this land use plan.

5.1.1 Other Federal Agencies

As a part of this planning effort and in implementing on-the-ground activities, BLM executes ESA Section 7 consultation with the USFWS. In 2001, BLM and USFWS finalized a consultation agreement to establish an effective and cooperative ESA Section 7 consultation process. The agreement defines the process, products, actions, schedule, and expectations of BLM and USFWS on project consultation. One Biological Assessment will be prepared to determine the effect of the Preferred Alternative on all relevant listed, proposed, and candidate species, and associated critical habitat. The Biological Assessment will identify all expected environmental effects, conservation actions, mitigation, and monitoring including analysis of all direct and indirect effects of plan decisions and any interrelated and interdependent actions. The USFWS may then issue a BO on the plan, as a result of the consultation process. As this plan's decisions are implemented, actions determined through environmental analysis to potentially affect species listed or candidate species for listing under ESA will initiate more site-specific consultation on those actions.

The Sikes Act (16 USC 670 et seq.) authorizes the DOI, in cooperation with state agencies responsible for administering fish and game laws, to plan, develop, maintain, and coordinate programs for conserving and rehabilitating wildlife, fish, and game on public lands within its jurisdiction. The plans must conform to overall land use and management plans for the lands involved. The plans could include habitat improvement projects and related activities and adequate protection for species of fish, wildlife, and plants considered endangered or threatened. BLM must also coordinate with suitable state agencies in managing state-listed plant and animal species when the state has formally made such designations.

The BLM coordinates its fire management activities with the actions of related federal and state agencies responsible for fire management. The Federal Wildland Fire Policy is a collaborative effort that includes the BLM, USFS, National Park Service, USFWS,

Bureau of Indian Affairs, the National Biological Service, and state wildlife management organizations. The collaborative effort has formulated and standardized the guiding principles and priorities of wildland fire management. Collaboration of the Federal Wildland Fire Policy on a nationwide scale has provided common priorities and objectives for federal land management agencies; protection of human life and property is a primary priority and protection of natural and cultural resources are secondary priorities. This policy also provides recognition of wildland fire as a critical natural process that should be safely reintroduced into ecosystems that are wildfire dependent across agency boundaries. The National Fire Plan is a collaborative interagency effort to apply the Federal Wildland Policy to all Federal Land Management Agencies and partners in state forestry or lands departments. Operational collaboration between the BLM, USFS, National Park Service, and USFWS is included in the Interagency Standards for Fire and Fire Aviation Operations 2009. This federally approved document addresses fire management, wildfire suppression, fuels management and prescribed fire safety, interagency coordination and cooperation, qualifications and training, objectives, performance standards, and fire management program administration.

The BLM or project applicant would coordinate with the USACE regarding any future activities within or affecting jurisdictional waters or wetlands; invasive plant removal within jurisdictional wetlands may require a permit if the soil would be disturbed or if heavy equipment would be used. EPA and USACE regulate wetland habitats under the CWA.

BLM would coordinate with DOD prior to approval of ROWs for renewable energy, utility, and communication facilities to ensure that these facilities would not interfere with military training routes. Additionally, DOD entities in the State of California requested that the BLM provide them with early notification of proposed renewable energy development on public lands. The objective of this early coordination is to provide an opportunity for the DOD to coordinate and consult with the BLM to inform BLM of DOD's concerns with the proposed renewable energy development project as it may relate to current and future military training missions including: military operating areas, military training routes, air space, and ground access.

For proposed renewable energy development, it is critical that this notification and coordination occur at the earliest possible stage, e.g., when permits for wind testing are being considered by BLM. This can help identify proposed wind energy projects which may impact current and future military operations before an applicant invests large amounts of money or time in a project. Early involvement by the military would alert an applicant when a project may be a concern to military operations and mission. It would also help identify changes in a proposed project and/or mitigation which would minimize impacts to current and future military operations. Changes may include reducing the number of wind turbines proposed for the area or relocating proposed individual wind turbines or solar power towers to minimize interference with military training routes.

BLM coordinates with the USBP on border initiatives and management, as well as the protection of cultural resources.

5.1.2 State, County, and Local Governmental Agencies

The BLM works cooperatively with CDFG. Under California laws, the CDFG is responsible for the preservation and management of fish and wildlife found within the State of California. The BLM is likewise responsible for the management of fish and wildlife habitat on BLM-administered lands. BLM assists CDFG by providing the appropriate agreements or permits for conducting wildlife management activities on BLM lands, as well as assisting with the collection of and sharing of data. BLM law enforcement patrols and enforces game violations on BLM lands.

Regional transportation planning and construction of roadways and highways is generally conducted by state or regional agencies, such as California Department of Transportation (Caltrans), county departments of transportation, and city transportation departments. When these agencies plan and develop roadways that cross public lands, BLM will coordinate with the responsible agency to develop design features that minimize the fragmenting effect of the planned roadway. BLM will work with the responsible agency to evaluate and incorporate safe and effective wildlife crossings to ensure the long-term viability of species and maintain habitat connectivity. Where planned roadways potentially fragment other resources, such as (but not limited to) recreation routes or trails, or mining operations, BLM will work with the responsible agency to provide continued connectivity for those purposes as well. BLM will also work with the agency to provide continued safe access to public lands from any developed roadway for recreation and other public land users.

BLM coordinates with CAL FIRE and the USFS on fire suppression under a Cooperative Fire Protection Agreement, and coordinates with CAL FIRE on water use for water tanks used in fire suppression.

BLM would coordinate with local communities, Native American tribes and groups, Cleveland National Forest, California State Historic Preservation Office, San Diego Archaeological Society, San Diego County, CDFG, USFWS, USBP, California State Parks, CAL FIRE, California State Lands Commission, and local public health and safety organizations, and various NGOs in the administration of the SRMAs.

5.1.3 Consultation with Native Americans

Formal and informal consultation and contacts were made with interested tribal entities at several points in the planning process in order to comply with EOs regarding Government-to-Government relations with Native Americans and other federal laws and regulations. BLM initially invited Native American tribes to formally consult on this project

through letters, which were sent in November 2008. A letter was sent to the chairman of each band or tribe with potential cultural ties to the Planning Area or who had expressed an interest in the Planning Area. Letters were also sent to council members, staff, and individuals who might have an interest or special knowledge of the Planning Area. Each letter detailed the need for a new plan, described the Planning Area, and requested comments on any and all issues that may have been of concern to the tribe, including religious or cultural values that may be affected by planning decisions. Native American tribes and interested persons will continue to be consulted and comments requested at key milestone points in the planning process, and consultation will continue through plan implementation. Native American tribal governments and organizations contacted are listed below.

- Campo Kumeyaay Nation
- Cocopah Indian Tribe
- Ewiiaapaayp Band of Kumeyaay Indians
- Fort Yuma Quechan Tribe
- Kwaaymii Laguna Band of Mission Indians
- La Posta Band of Kumeyaay Indians
- Manzanita Band of Mission Indians
- Torres-Martinez Desert Cahuilla Indians
- Colorado River Indian Tribes

5.1.4 Consultation with the California State Historic Preservation Officer

The BLM initiated formal consultation with the SHPO by letter in November 2008. BLM initiated consultation in accordance with the Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers regarding the manner in which BLM will meet its responsibilities under the National Historic Preservation Act (1997) and the Protocol Agreement between the California State Director of the BLM and the California SHPO (1998). Consultation regarding historic properties that might be affected by this plan is ongoing. Consultation regarding historic properties that might be affected by this plan will continue, and final determinations and findings for both the plan and the designation of routes of travel will be completed and reflected in the ROD.

5.1.5 Partnerships

The BLM works cooperatively with many partners, including, but not limited to:

- Colleges and universities and other academic institutions
- Chambers of commerce in adjacent communities such as El Centro, Imperial, and Brawley, California, as well as Yuma, Arizona
- The American Sand Association, Kris "Chili Dog" Frick Foundation, United Desert Gateway, Sierra Club, Desert Protective Council, and other non-profit organizations

5.2 List of Preparers and Contributors

Though individuals have primary responsibility for preparing or contributing to sections of the DRAMP/DEIS, the document is an interdisciplinary team effort (Table 5-1). In addition, internal review of the document occurs throughout preparation. Specialists at the BLM's field office, state, and Washington office levels review the analysis and supply information, as well as provide document preparation oversight. Contributions by individual preparers may be subject to revision by other BLM specialists and by management during internal review.

TABLE 5-1
LIST OF PREPARERS AND CONTRIBUTORS

Name	Job Title	Years of Expertise	Primary Responsibility
BLM El Centro Field Office			
Dreyfuss, Erin	Environmental Protection Specialist	4	Project Coordination; Vegetation; Special Status Species
Haggar, Jenny	Field Office Archaeologist	4	Cultural Resources
Hamada, Neil	Recreation Area Manager	15	Recreation Management; Routes of Travel
Johnson, John	Wilderness Coordinator	5	Special Designations; Visual Resources
Neilans, Jamie	Recreation Staff Chief	6	Recreation Management
Nieblas, Salvador	Supervisory Law Enforcement Ranger	15	Public Health and Safety
Self, Linda	Realty Specialist	17	Land Tenure
Simmons, Carrie	Field Office Archaeologist	4	Cultural Resources; NEPA Coordination
Steward, Daniel	Resources Staff Chief	6	Vegetation; Wildlife; Special Status Species
Wood, Vicki	Field Manager	10	Management Oversight

TABLE 5-1
LIST OF PREPARERS AND CONTRIBUTORS (CONT.)

Name	Job Title	Years of Expertise	Primary Responsibility
BLM California Desert District Office			
Waiwood, Robert	District Geologist; Mineral Examiner	33	Mineral Resources
Zale, Thomas	Senior Resource Advisor	31	Project Coordination
BLM California State Office			
Abbott, Jim	Acting State Director	30	Management Oversight
Ayers, Mike	Outdoor Recreation Planner	25	Recreation
Evanisko, Fran	GIS Analyst	20	GIS and Graphic Support
Fesnock, Amy	T & E Specialist	15	T & E Species
Lund, Christina	State Botanist	10	Priority and Special Status Plants
Keeler, James	Outdoor Recreation Planner	25	Recreation
McGinnis, Sandra	Planning and Environmental Coordinator	17	Planning; Review
Pogacnik, Tom	Deputy State Director - Natural Resources	25	Management Oversight
RECON Environmental, Inc. and Associates			
Benn, Candie	Client Care Program Manager	20	Client Liaison
Blocker, Eija	Production Specialist	18	Editing, Formatting, and Production of Deliverables
Bohac, Sean	GIS Analyst	6	GIS and Graphic Support
Hull, Warren L. "Skip"	Director of Economic Analysis, CIC Research, Inc.	30	Economic Analysis
Johnson, Cheryl	Environmental Planner	6	Air Resources
Kazmer, Greg	Production Specialist	3	Production of Deliverables
Kubota, Gordon	President, CIC Research, Inc.	40	Economic Analysis
Morales, Susy	Wildlife Biologist	12	Writer/Editor; Vegetation; Wildlife; Special Status Species
Simmons, Gregg	Manager, Simmons Environmental and Natural Resource Consulting, LLC	31	Environmental Planner and Technical Advisor
Underwood, Jackson	Archaeologist	22	Cultural Resources; Social Setting
Woods, Lori Jones	Environmental Planner, Landscape Architect	27	Principal in Charge; Visual Resources
Wright–Harris, Sharon	Writer/Editor	14	Writer/Editor
Zepeda–Herman, Carmen	Archaeologist	10	Cultural Resources

GPO U.S. GOVERNMENT PRINTING OFFICE:2010 — 671-193

THIS PAGE IS INTENTIONALLY BLANK.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
El Centro Field Office
1661 S. 4th Street
El Centro, CA 92243

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

PRIORITY MAIL
Postage and Fees Paid
Bureau of Land Management
Permit No. G-76